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THE

FARMER'S MAGAZINE,

AND

MONTHLY JOURNAL

OF

THE AGRICULTURAL INTEREST.

Dedicated

TO THE

FARMERS OF THE UNITED KINGDOM.

LONDON:
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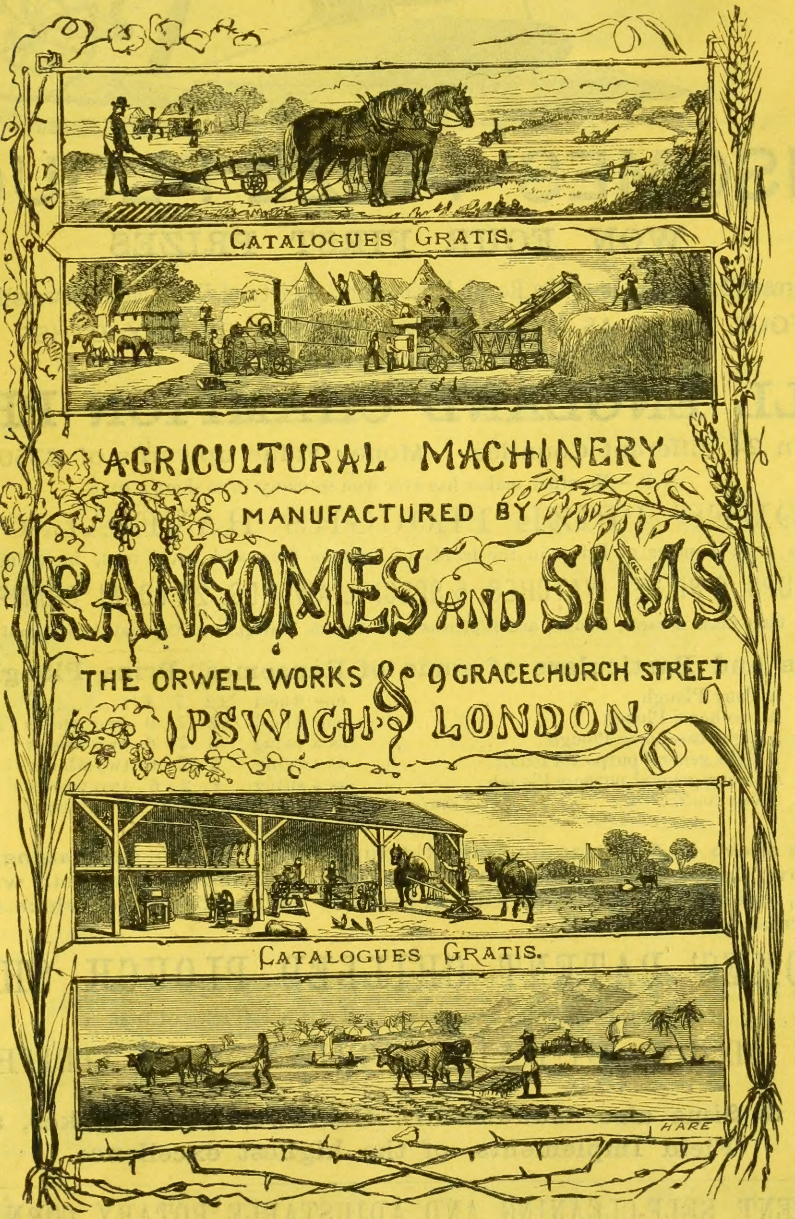

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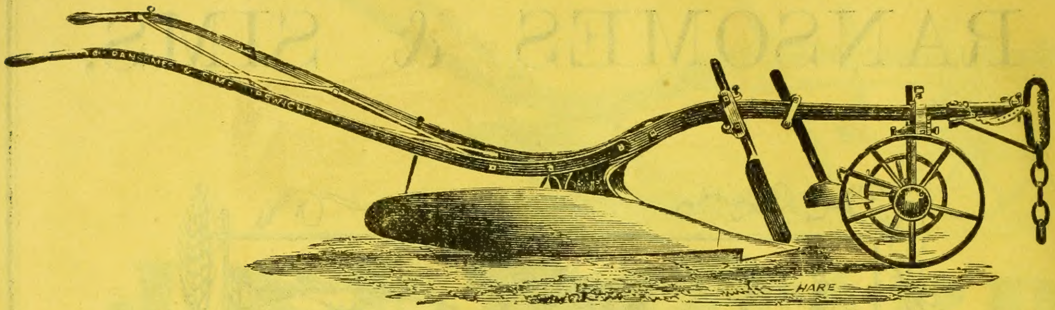

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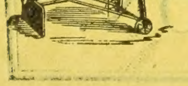

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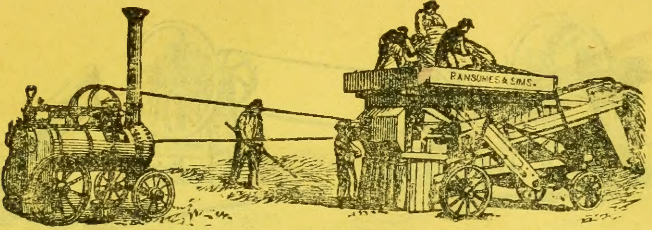
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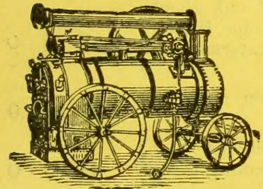

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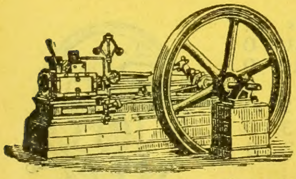

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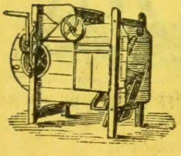

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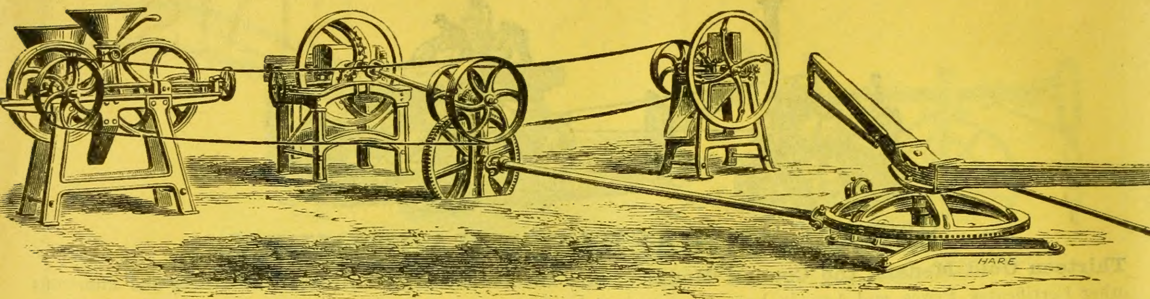

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Intermediate Motion, for either,	4 0 0	Pulleys and Straps according to size.	

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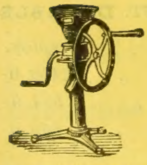

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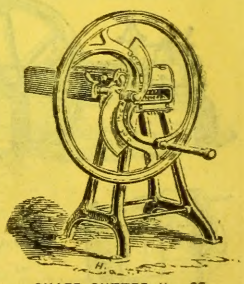
Chaff Cutter No. 22 . . . . . . (*The cheapest Chaff Cutter in the trade*)	2	10	0
Oil Cake Breaker No. 2	2	2	0
Biddell's Patent Oat Mill No. 4	3	3	0
Biddell's Patent Bean Cutter or Maize Splitter .	3	13	6
Biddell's Patent Combined Mill for beans and oats, **No. 10**	5	5	0
Ditto, for beans, oats, and oil cake, **No. 11** . .	6	6	0
Ditto, for beans, oats, and oil cake, stronger, **No. 17**	8	8	0
Gardner's Patent Turnip Cutter, Single-action, for sheep . .	4	5	0
,, ,, ,, ,, Double-action for sheep and bullocks	5	5	0
Biddell's Patent Root Pulper, No. 10	4	4	0



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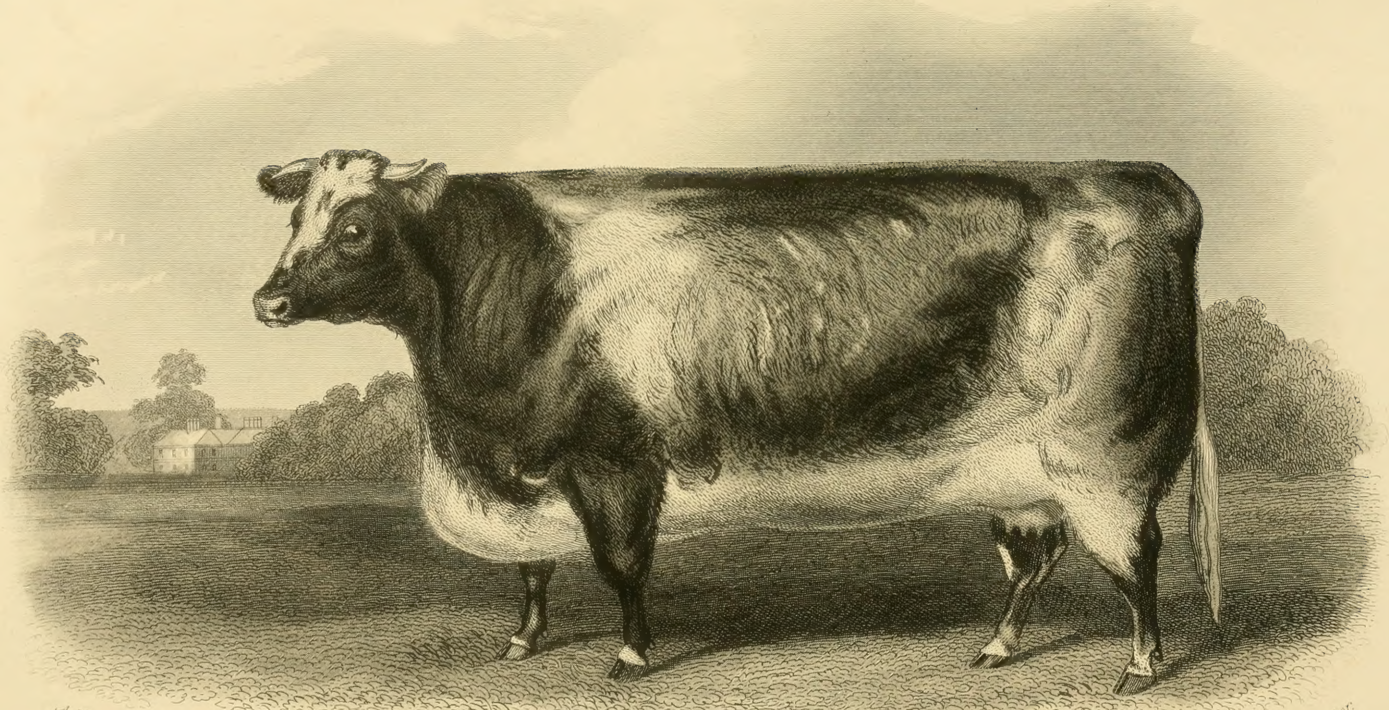

A. M. Gauci

E. Hacker.

Charlotte 4th

A Prize Shorthorn Heifer, the property of Mr. J. Logan, of Maindee House, Newport, Monmouthshire.

London: Published by Rogerson & Tuxford, 246, Strand, 1867.

B. T. Brandreth Gibbs

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THE FARMER'S MAGAZINE.

JANUARY, 1867.

PLATE I.

PORTRAIT OF MR. B. T. BRANDRETH GIBBS.

PLATE II.

CHARLOTTE IV; A PRIZE SHORTHORN HEIFER.

MR. B. T. BRANDRETH GIBBS,

THE HONORARY SECRETARY OF THE SMITHFIELD CLUB.

Mr. Brandreth Gibbs is the youngest son of the late Mr. Thomas Gibbs, of Ampthill, Beds, and of Brompton Lodge, Old Brompton, Middlesex, who married the daughter of Mr. Thoswihan Brandreth, J.P., of Houghton Hall, Beds, and hence the family name of Brandreth. Mr. Gibbs having studied under the Rev. H. S. Pollard, M.A., and subsequently under the Rev. M. Marcus, M.A., was about to enter at St. John's, Oxford, in which College the family had a claim to founder's-kin Fellowship, with the intention of eventually going to the bar; but he was suddenly induced to turn his attention to commercial pursuits, in consequence of a death in the family having opened a field of immediate action for his energies in the seed trade. Hence his being at an early period of his life actively engaged in carrying out the proceedings of the Smithfield Club, and of the annual shows of the Royal Agricultural Society of England, as more recently of the agricultural and implement department of the Great Exhibition of 1851 and the Paris Universal Exhibition of 1855. At the first meeting of the Royal Agricultural Society at Oxford in 1839, Mr. Gibbs acted as one of the stewards of the yard—in the place of a steward who was an exhibitor—and he continued to act with his brother in the management of the succeeding shows of that Society up to 1844, and of the Smithfield Club up to 1843, at which period he became the Honorary Director of the country shows of the "Royal" and the Honorary Secretary of the Club, to which offices he was unanimously elected at the age of 22. At the annual meetings of the Royal Agricultural Society of England, from 1844 to 1865, the arrangements of the shows, both as regards live-stock and the exhibition and trial of machinery, have been conducted under Mr. Gibbs' direction. When the preliminary arrangements for the Great Exhibition in 1851 were in progress, the Royal Commissioners, through the late Mr. Pusey, M.P., one of their number, sought Mr. Brandreth Gibbs' assistance in the agricultural machinery department, and he undertook the office of superintendent of Class 9, one of the most extensive divisions of the Exhibition, and was afterwards selected as a Juror in the same class. During the preliminary preparations for the Paris Exhibition, 1855, Mr. Gibbs was engaged for the Board of Trade in superintending the selection of British agricultural machinery intended to form part of that collection, and to which department no less than five of the much-coveted gold Medals of Honour were awarded. In the same year the manner in which Mr. Brandreth Gibbs had applied himself to the advancement of the agricultural interest was marked by his receiving from the hands of the Duke of Richmond, the President, a handsome testimonial, subscribed to by the agriculturists of the kingdom, in acknowledgment of his services as Honorary Secretary to the Smithfield Club. The Imperial Government of France, also, awarded him a gold medal in some return for the assistance he had given as a member of the English Committee of Advice for the International Agricultural Exhibition in Paris in 1856. In 1857 he published the "History of the Smithfield Club," tracing the principal events and changes that had taken place since its formation: to this was added a variety of statistical tables, in reference to the prizes won by different breeds of animals and to other matters. Mr. Brandreth Gibbs became a member of the Club as early as 1837, was its first life-member, and is now within fourteen of being the oldest member on the list. On the Royal Agricultural Society being suddenly placed without a Secretary in 1859, Mr. Brandreth Gibbs became its Honorary Secretary *pro tem.*, and continued for seven months to superintend the official work—thus, during the very successful meeting held at Warwick, combining the offices of Honorary Secretary of the Society and Honorary Director of the Show. To mark their appreciation of his valuable assistance, the Council voted him the Society's large Gold Medal, accompanied by their thanks handsomely illuminated on vellum, as presented to him at the General Meeting held at Canterbury in the following year. Mr. Gibbs filled the same offices in connection with the Great Exhibition of 1862, as he had done at the first Great Exhibition in 1851. The Royal Horticultural Society elected him a member of their Council in 1865, and he has been instrumental in the promotion of a country show of horticultural produce being held in future at the same time and place as the exhibitions of the Royal Agricultural Society of England. Mr. Gibbs was further elected a Vice-President of the International Horticultural Exhibition held at South Kensington during the past year, and he also undertook the duties of Secretary of the Committee for Agricultural and Horticultural Machinery in reference to the Paris Meeting of 1867, for which he has received the appointment of Commissioner to represent Great Britain in all matters relating to agriculture on the Committee of Advice—especially in reference to the trials at Billancourt—and Superintendent of British agricultural machinery in the Exhibition. In business Mr. Gibbs is known as the acting head of the firm of Gibbs and Co., the seedsmen in Half-Moon Street, Piccadilly; while in private life he is esteemed by a wide circle of acquaintances, and is not only a good linguist, but accomplished in music and different branches of the fine arts. The History of the Smithfield Club, however, is perhaps the most available illustration of Mr. Brandreth Gibbs' peculiar talent in the way of methodical arrangement, and that orderly disposal of business which have rendered his services to agriculture so really valuable.

CHARLOTTE IV; A PRIZE SHORTHORN HEIFER.

THE PROPERTY OF MR. J. LOGAN, OF MAINDEE HOUSE, NEWPORT, MONMOUTHSHIRE.

Charlotte 4th, a roan heifer, bred by Mr. Logan, and calved on March 29th, 1863, is by Duke of Knowlmere (19,623), out of Charlotte by Noble Arthur (16,621), her dam Celina by Highland Laddie (13,026),— Crummy by Cotherstone (6,902), — Crummy by Locksley (4,240),—by Stanhope (5,315),— by Prince (4,772).

Duke of Knowlmere, a red bull, bred by Mr. Jonathan Peel, and calved March 31st, 1861, is by Third Grand Duke (16,182), out of Bountiful by Second Grand Duke (12,961), her dam Blissful by Grand Duke (10,284). Duke of Knowlmere is now the property of Mr. Logan.

Charlotte, a roan cow, the dam of Charlotte 4th, was bred by Mr. Strafford, the shorthorn auctioneer, at Dudding Hill, Neasdon, and calved on April 7th, 1859; but she is also in Mr. Logan's herd, where her produce have been—in 1861 a roan cow-calf, Charlotte 2nd, by The Chief (18,976); in 1862, a white cow-calf, Charlotte 3rd by Prince Imperial (15,095); and Charlotte 4th in 1863.

In 1864, as a yearling, Charlotte 4th took the first prize of her class at the Bristol Meeting of the Bath and West of England Society, with other first prizes at Cowbridge, Abergavenny, and the Tredegar Shows, as well as the Corporation Cup at Newport for "the best animal of any breed." In 1865, Charlotte took the first prize as a two-year-old at the Hereford Meeting of the Bath and West of England Society, the second prize at the Royal Agricultural Society's Meeting at Plymouth, and the first prize with an extra prize as the best shorthorn in the show at the Tewkesbury Meeting of the Gloucestershire Agricultural Society.

On first encountering Charlotte 4th at Bristol in 1864, we thus reported: "A herd not yet so much heard of, but threatening, if only held together, soon to make its mark—that of Mr. Logan, of Maindee, Monmouthshire—got as high as second and third for heifers in-milk or in-calf. They are both very good, and the pick of the two a sweet, stylish one, with a rare back, but a little patchy over her quarter. There were two or three well-won commendations amongst this lot, as there were with the younger heifers, amongst which Mr. Logan did better still with a lengthy, blood-like one, very attractive in her appearance, and that had the credit of fairly beating the good second and third from Wall's Court, both of very fine quality, together with a good, thick, useful heifer of Mr. Sharpe's own breeding. It is clear enough that those Christmas gatherings at Tredegar have not been without their effect; whether, as Mr. Carr puts it, you go for Hereford or Shorthorn." The lengthy, blood-like heifer so attractive in her appearance is Charlotte 4th. Again at Hereford, in the year following, we said: "Mr. Logan, who is gradually making his way, was noticed for a very good cow, and more distinguished in the next class for his handsome heifer—deep, square, and light in her bone, with nice quality, and altogether bound to make a favourable impression go where she will"—an opinion which was fully sustained at the Plymouth Royal, where she was only beaten by Mr. Booth's Lady Fragrant.

THE CONGRESS AT LEAMINGTON.

BY CUTHBERT W. JOHNSON, F.R.S.

The recent meeting at Leamington, to discuss the best modes of utilizing sewage, will have the effect of diffusing much valuable information. It is true that sweeping conclusions were there sometimes hazarded, and the naturally uncompromising fervour of scheming patentees copiously displayed; but the great defect of many of the speakers at the Congress was, that very few of them, who had sufficient *science* to understand the nature of the sewage of a town, were *practically* conversant with the difficulties of its collection and removal.

To most of the members of the Leamington Congress, the word "sewage" merely comprehended the matters of the water-closet and the scullery. "These," said one party, "should go to the land, the rain water to the river." By such persons the loss of the large amount of soot and other impurities removed from our roofs, and the still richer street water (in granite-paved towns containing one per cent. of potash) full of inorganic matters, were to be utterly disregarded. They were to be sent to the nearest river, mingled with all the impurities from factories, urinals, &c., to infallibly bring the town into the Court of Chancery by the nuisance thus created.

The modes to be adopted to effect this highly-difficult separation of the sewage and the rain water were many and very amusing; some betraying a great want of information as to the very composition of sewage, and others proposing plans that have long been tried and condemned. One scheme was reproduced and well described—that of earth-closets. This, I believe, was first suggested by the Rev. Henry Moule, of Fordington (*Jour. Roy. Ag. Soc.*, vol. xxiv., p. 111), and is one that, for country houses and villages, will very likely be productive of considerable advantage; for, in such places, it is not always that water-closets and proper drains can be formed for conveying the sewage on to the land. But in principle and in practice it is, compared with the system of sewage irrigation, going more than one step backwards. Every sewage schemer will agree in one primary conclusion, viz., that the problem to be solved is this: How is sewage to be most economically conveyed to the land? Now, it is idle to suggest that the proposed plan of carting dried earth to every house in a town, seeing to its regular application to small cottage closets (and these are ever the most offensive), and to the regular removal of the mingled earth and excreta, can be compared in this respect with that system of sewers where the sewage removes itself, flowing away by its own gravity. It must not, however, be supposed that the adoption of earth-closets would, for towns, render sewers unnecessary; sewers must still be constructed to carry away the rainfall from the houses, streets, factories, &c., and these must be as carefully and as expensively made, and as regularly flushed with water, as those sewers which receive in addition the drainage of houses.

The result of the investigations and evidence produced at the meeting led the Congress, by a large majority, to arrive at a conclusion in favour of sewers and house drains. It is to be always borne in mind that when sewage is employed in the irrigation of grass-land there are *two* portions of the sewage whose value must be allowed. First we must remember that the mere rain-water from the streets and house-roofs is, when annually applied at the rate of from three to six thousand tons of water per acre, of very great fertilizing power; the amount of mere water thus applied is only equal to a rainfall of from thirty to sixty inches per acre—an amount hardly greater than that showered down upon the great grazing districts of the western side of our island.

The irrigation plan adopted at Croydon was well described and defended by Dr. Carpenter and Mr. Baldwin Latham. The description given by the engineer to the Croydon Board of Health can hardly be too generally known.

Mr. Latham remarked at the Congress: "The population of Croydon at the present time is nearly 50,000, and the sewage is disposed of at four principal outfalls: Croydon Town, on the land at Beddington, 270 acres of which are under irrigation; South Norwood and part of Addiscombe, on about 37 acres of land at Blind Corner; Thornton Heath, on about 30 acres of pasture land and market produce; Upper Norwood, draining into the Metropolitan sewers. At the two principal outfalls, viz., Beddington and South Norwood, the sewage, before passing on the land, is strained to keep back the more crude portions, which experience shows are objectionable when passed on the land at the same time as the liquid portion. The solid matter thus kept back, after being mixed with street sweepings or earth, and allowed to stand for a few days until quite solid and free from odour, is used on the land in conjunction with irrigation with great advantage. The reason for keeping back the solid matter is principally to guard against nuisances, as such matter lying on the face of an irrigated field, and exposed to the action of the elements, would become a nuisance until absorbed or deodorised by the soil; there is also another reason, which is, that solid matter in a crude state, as it exists in sewage, together with the action of water, is found to injure the produce. The liquid portion of the sewage, containing all the matter in solution, and much finely-divided matter in suspension, after leaving the filter in which it has been strained, is brought to the head of each field by a channel. At the Beddington outfall the channels are all open; but at Norwood the principal channels are covered in. Earthenware pipes are used for this purpose, and the sewage is afterwards distributed by open channels or carriers.

"The Croydon system is very simple and most effectual, and may be carried on in various ways, according to the nature of the land. The sewage can at all times be applied to the plant, for it never comes in actual contact with the plant itself, but runs in a thin film over the surface of the ground at the root of the plant. The result is that the sewage may be applied during all stages of the growth of the plant up to the time of cutting the crop, and it only need be withdrawn from the land a very limited period previous to the time of cutting. In carrying out this system it is absolutely necessary to prepare the land for the reception of the sewage, by carefully levelling it, so that no holes or uneven places may exist. An uneven place will certainly retard the flow of the sewage; and if the sewage should be allowed to stagnate, owing to the unevenness of the ground, it will effectually destroy instead of invigorating the growth of the crop. The sewage of Croydon varies in bulk from 50 to 120 gallons per head per day of the population.

"In all works for the utilization of sewage," added Mr. Latham, "simplicity is the great object to be attained, and it is surprising how nature will assist the simple efforts to aid her in the fulfilment of her purposes: whilst, on the other hand, the most expensive systems, if not in accordance with her teaching, must turn out to be failures.

I will now endeavour to show that the system of utilising town sewage, as practised at Croydon, is in union with the known principles that govern the growth of plants. The fertilising matter of sewage as applied in irrigation is principally in solution; now, as fertilising matter in this state is much more readily absorbed by the land, the plant has its food presented to it in a state ready for assimilation; the consequence is, it grows rapidly, and as the period of its growth is shortened a greater number of suitable crops can be taken from the same ground in a season, under the irrigation system, than under the ordinary process of farm manuring. The obvious difference between the system of manuring with solid manures and with sewage is this, that the solid manures are applied to the land, while the sewage is applied more directly to the plant; in both cases the land is the medium of applying the nutriment that goes to build up the tissues of the plant, but if a given amount of fertilising matter in a dry, and also in a liquid state, are applied, the liquid manure is at once food for the plant, while delays must take place before the solid manure can be assimilated; for solid manure must be exposed to atmospheric influence until it becomes soluble, and then it must be taken into solution by water before it is food for the plant; so that it is quite obvious, all other matters being equal, that a greater number of crops can be taken from the same area of land under the-liquid manure system than under the dry-manure system, and which is equivalent to an increased area of land, but with this advantage, that there is but one rent or first charge upon the land."

Mr. Latham next addressed himself to the value of the mere water carried on to the land in sewage, and to the use of sewage in winter. He told the meeting truly enough that "water alone has a special value as the medium of fertilisation, and the results the author has been able to arrive at, from his experiments on extensive irrigation works in which water alone has been used, show that every thousand tons of water per acre are worth one pound sterling value per annum. Such is the enormous quantity of water that enters the roots of a plant, that common grass with a moist soil will evaporate 10 tons of water per day; and if this rate is only carried on for half the year, it gives 1,800 tons of water per annum as the amount exhaled by one acre of grass plants. If such is the amount of water requisite for the healthy growth of one or two crops of common grass, how much will be exhaled by the plants on a sewage irrigation field where four, five, or even six crops are taken in the season?

"It is generally supposed that sewage is not applicable to land throughout the entire year, and that the fertilising matter of sewage applied in the winter six months is lost: but this view does not accord with our experience at Croydon, for we find the purification as perfect in winter as in summer, and that we get the full benefit from the application of sewage applied throughout the entire year, which may be accounted for by the simple fact that the purification of sewage is due to the power soils have of separating the fertilizing matter from the sewage, and holding it until required by the plant.

"Clay soils have much greater affinity for ammonia and other fertilizing matters than porous sandy soils: and it is partly due to this property that clay soils excel in productiveness any other when treated with sewage. For utilizing sewage the soil performs the threefold action of extracting the fertilizing matter, the filtering it for the food of the plant, and lastly, retaining it until required for the use of the plant. That this is the probable explanation of the process may be gathered from the fact that clay soils, though less mechanically absorbent, but having a greater affinity for fertilizing matter than sandy soils, purify sewage more effectually, and produce better and heavier crops. Again: at night, when the the plant is commonly at rest, and yet the circulation of the sap is going forward (being kept up by the process of evaporation from the leaves of the plant, and the capillary attraction of the roots), it is found that the guano matter prepared in the soil is partially evaporated from the plant, which would go to show that it has been fitted for it, and only needs the active property of light to properly utilize it. Again, probably the best proof that the soil attracts and retains the fertilizing matter of the sewage is found in the fact that the first crop of the season on a sewage irrigated farm will nearly equal in weight one-half of all the remaining crops of the season; which shows that the fertilizing matter stored in the winter has been made use of by the plant in the spring."

And then as to the advantage to the grass produced by the temperature of sewage, the following is the description given by the lecturer:—

"The produce of the sewage-irrigated farms of Croydon, unlike that of ordinary farms, is always in a state of growth, not quite so active in winter as in summer; yet at no time can there be said to be an entire cessation of growth. This in a great measure is due to the temperature of the sewage, and also to the effects of its motion over the surface of the land. The value of the temperature of the sewage cannot be over-estimated in a country similar to this, in which excessive changes of atmospheric temperature often suddenly take place, which injuriously affect both plants and animals. The value of the high temperature of sewage is more particularly demonstrated in the depth of winter, and during long and continued frosts; and it is rather a remarkable coincidence that when the greatest degree of temperature is required the sewage possesses it; that is, the temperature has been found by the author to increase with the period of duration of frost. This is probably owing to the stagnation of surface water, and also to the habits of the people, as much less cold water is used in the depth of winter than at other times. So great is the value of temperature, that a crop under sewage irrigation may be seen growing even at the time of severe frost. The author, from an experiment made during the winter of 1864 upon the irrigation fields at South Norwood, and carried out during a period of severe frost, was enabled to cultivate a crop of rye-grass, which was only sown in the early part of the month of November, and when measured at Christmas the same year was found to be six inches in height, and then growing luxuriantly. During the following year six crops were cut, the last of which was within one week of Christmas-day, 1865.

The 1st	crop measured	...	35	inches in length.
,, 2nd	,,	...	40	,, ,,
,, 3rd	,,	...	42	,, ,,
,, 4th	,,	...	32	,, ,,
,, 5th	,,	...	24	,, ,,
,, 6th	,,	...	14	,, ,,

Grand total, 187 inches, or 15 ft. 7 in. in height, which realized about £40 per acre, or, when calculated by the inhabitants contributing to the sewers, the money received for the produce was equal to 6s. per head of the population. During the present year, five crops have been taken from the land, and have realized equally good prices. Crops nearly as good have been taken for six years from the sewage-irrigated farm at Beddington.

"The soil at Beddington is sandy upon a gravelly subsoil, while at South Norwood the soil is clay. Prior to the application of the sewage to the clay soil at Norwood, it would not pay to take the land for ordinary farming purposes at 20s. per acre; but since the application of sewage to it, the Local Board of Croydon have had an offer from Mr. Cousins, the present tenant, which shows that he is willing to give £16 per acre rent for the land and sewage, for a term of 12 years.

"One great result to be arrived at in the utilization of sewage is the prevention of the pollution of rivers—in short, the purification of the sewage before being turned into any stream; and upon this head the results are most satisfactory. In the case of Croydon, the sewage of that town, after being utilized, positively contains less total constituents than some of the water furnished by the public companies to the metropolis. The sewage, after passing over the land, has been found to contain the following amount of foreign matter:—

	Inorganic grains per gallon.	Organic grains per gallon.	Total grains per gallon.
October	23.40	2.40	25.80
November, after sharp frost	20.80	2.77	23.57
Mean	22.1	2.58	24.68

In arriving at a correct conclusion as to how much sewage remains in the water, it must be borne in mind that all water that has been in contact with earth, more or less, takes up some of its constituents, and thus a certain amount of matter present is due to the natural property the water has of dissolving and appropriating the elements of the soil, so that it is only reasonable to conclude that water taken from the soil of a particular district, and allowed to pass over or through that soil, would not purify itself, but would probably take up more of the constituents of the soil. Testing the sewage after purification in this way, by comparing it with the water supplied to the town, it will be shown at once what excess the sewage possesses over and above the water of the district. The following is the result of the analysis of the public water supply at Croydon:—

Inorganic Grains per Gallon.	Organic Grains per Gallon.	Total Grains per Gallon.
20.02	1.09	21.11

EXCESS IN SEWAGE AFTER IRRIGATION.

Inorganic Grains per Gallon.	Organic Grains per Gallon.	Total Grains per Gallon.
2.08	1.49	3.57

The excess of constituents in the drainage water after purification must be reduced, for the drainage water represents a much larger volume of sewage; for in passing over the land a quantity of water is evaporated, which tends to condense the impurities that remain.

"From experiments made by gaging the water flowing on or off the land at Croydon, a difference of 20 per cent. was often found; assuming that half this difference was due to evaporation, it tends to show that the effects of utilization practically perfectly purify the sewage.

"As to the effect of the utiilzation of sewage on the public health of the town, it is quite clear that no ill has resulted from it, nor have any persons living in the neighbourhood been affected with any particular disorder in consequence of the close proximity of the works; in fact, it can be clearly shown, from an examination of the mortality tables of Croydon, that Norwood has been healthier since the irrigation works were established there than ever known before."

"It has been alleged by some persons that the produce grown on irrigated fields is unwholesome for cattle, and unfit and incapable of being made into hay. The following letter on this subject, which has been addressed to me by Mr. Cousins, the tenant of the irrigated ground at South Norwood, in reply to some objections may be of service:—

"'Selhurst-road, Croydon, Sept. 29th, 1866.

"'SIR,—I am led to write these few observations from having noticed a letter in a Norfolk paper written by a Mr. Bardwell, in which he runs down sewage irrigation wholesale; and as his observations are very wide of the truth, and must arise from a very imperfect knowledge of what he is talking so loudly about, permit me to give you my experience as occupier of the Norwood Irrigation, Croydon. I cut my grass several times a year, winter and summer, and it is preferred by cattle to any other; and as they milk better, and are in better condition than when fed on anything else, I sell to all the cowkeepers in the neighbourhood; and, what is very singular, that although rinderpest has been raging in this locality, not a single beast fed on sewage grass has been attacked.

"'I have not the slightest difficulty in selling my produce, but quite the contrary, nor in making the grass into hay, except in bad weather. Last year all my hay was sold, and fetched from the stack at prices equal to the best in the neighbourhood; and my customers like it so well that I have already had numerous inquiries from them for new hay.

"'I feed all my horses upon the hay in winter, giving them nothing but a handful of beans; and one horse, by way of experiment, has never had anything else, yet they are fat, healthy, and work hard. Last year I milked ninety cows on nothing but the grass. They milked first rate, and when they went off their milk I gave them half a bushel of swedes per day with the grass; upon this alone they fatted better than I have ever before experienced. To another lot I gave 7lbs. of cake and a bushel of swedes per day with upland hay, and they did not do near so well as those fed on sewage grass.

"'As for the meat being tainted, and so on, I must say, from a large experience as a wholesale and retail butcher, together with my practical farming knowledge, that nobody but a penny-a-liner would write such bosh on sewage irrigation farming.
"'I am, sir, your obedient servant,
"'SAMUEL COUSINS.
"'B. Latham, Esq., Town Hall, Croydon.'"

Then, again, it has been urged that the milk of cows fed off the sewaged grass would be poorer than when fed on unsewaged grass. The milk of cows fed in both ways was therefore examined by the Rugby Commissioners (*Jour. Roy. Ag. Soc.*, vol. xxiii., p. 81). They found that the mean composition of 100 parts of milk from cows fed with both kinds of grass was as given in the following table:—

COWS FED ON GRASS ALONE.

	Unsewaged; Mean of Nine Samples.	Sewaged; Mean of Ten Samples.
Casein	3.246	3.241
Butter	3.604	3.430
Sugar of milk, &c.	4.405	4.218
Mineral matter	0.753	0.776
Total solid matter	12.008	11.665
Water	87.992	88.335
	100.000	100.000

"In a financial point of view, the results at Croydon have been most successful; in fact, at one time the Croydon Local Board were spending money in unsuccessfully treating the sewage by deodorizing with chemical agents at the rate of nearly £3,000 per annum; but when they abandoned the deodorizing schemes, and adopted the natural process of utilization, they at once made a profit. The results achieved at Croydon can be accomplished in other places, yet the process may not always yield a large profit, but generally will be found to give a fair rate of remuneration."

It is needless to attempt to add to the clear, practical details of Mr. Latham's valuable evidence. It is, I believe, by the use of town sewage in irrigation that the best results are to be obtained. All other plans, involving the continued unremitted attention of the householder and the sanitary authorities, will be not only very far less profitable to the ratepayers, but endanger their comfort and their health.

CENTRAL FARMERS' CLUB.

ON THE BEST MODE AND PERIOD OF APPLYING MANURE TO THE LAND.

The last meeting of the Farmers' Club for the year was held on the Monday in the Smithfield Show week, at the Club House, Salisbury-square, when the above subject was introduced by Professor Voelcker, to a very full attendance of members.

The **Chairman** (Mr. Smythies), having briefly announced the topic for consideration,

Professor **Voelcker** said so much has been said and written about the best mode and period of applying manure to the land, that I had some misgivings before I could make up my mind to introduce to-night a subject, which perhaps some may consider very stale or threadbare. More experienced men than myself have frequently and ably discussed kindred agricultural matters. Some have given us the benefit of their experience as regards the best time of the year when farmyard manure should be carted on the field, to what crop it should be applied, and the precise condition and mode in which dung should be used and incorporated with the soil; others have told us much that is particularly valuable to the farmer, who is more dependent upon artificials than upon yard-manure for restoring the fertility and improving the productive powers of his land. In short, the subject of the application of manures to the land has been discussed repeatedly in its more theoretical and in its more practical aspect. The propriety of my addressing you to-night on a matter on which already so much has been advanced which is good and valuable therefore may be questioned by some, the more so as I cannot announce to you any recent chemical discovery which might be useful to you in enabling you to apply more profitably this or the other known fertilizer, or in directing your attention to some hitherto unemployed means of imparting increased fertility to the land. However, the misgivings which I certainly entertained myself when I was invited by your committee to open the discussion in the Smithfield Club show week, I felt could not long be reasonably maintained by me, for you may depend upon it there is much more truth in the proverb uttered many centuries ago by Solomon the wise, than the generality of men are inclined to admit in an age of railway locomotion, and unprecedentedly rapid progress in every department of human industry and relationship. Indeed, were we to exclude from agricultural discussions topics which are old, and only admit those which are new, I have no hesitation in saying agricultural discussions often would be even less profitable than they are sometimes, and we might as well abandon them altogether. For my own part, I congratulate myself that it is no part of my duty to-night to have to direct your attention to an agricultural discovery with which I may be supposed to be more familiar than others engaged in the practical pursuits of life. Agricultural novelties, emanating from scientific men, I am sorry to say, seldom are such as to inspire good farmers with much confidence in the wisdom, judgment, and sound business character of their originators. An audience composed of so many intelligent and eminently practical men as that which I have the pleasure of addressing this evening has a keen and almost intuitive sense of appreciating what is sound in practice and what is mere unsupported theory. I frankly confess, I would consider it folly to submit to such a court of appeal any scientific discovery affecting agriculture, which has not stood the test of the experience of a number of intelligent practical agriculturists. If, however, the subject on the discussion card has not the doubtful merit of an agricultural novelty, nor the charm of an ingenious invention, I believe it has the advantage of giving gentlemen a good opportunity of discussing the pros and contras of certain prevailing practices of applying natural and artificial manures to the land, or of reconciling many apparent contradictions in the actual practice of different farmers. The subject affords ample scope for a discussion, which I trust will elicit valuable information on many points, such as the best time of the year for applying top-dressings to wheat, the most profitable manner of applying artificial manures to root-crops, or the best mode of disposing of yard-manure. The variable character of the soil in different counties, or on particular farms, and the general system of farming pursued in different localities, necessarily must, and always will, greatly influence the experienced farmer in the selection and application of manures to his land; and hence we must expect the expression to-night of opinions which may appear to contradict each other. The practical utility of agricultural discussions, if I am not mistaken, does not consist so much in the fact that they bring to light new views or practices with which the majority of farmers are not perhaps well acquainted, but that amongst other benefits they bring out the exact conditions under which often diametrically opposite practices may be recommended with equally good reason. In inviting discussion to-night, I hope those taking part in it will not be satisfied by merely stating the results of their actual experience, but that they will also point out the reason why they prefer one practice to another, and why the plan which is generally adopted by intelligent farmers is not resorted to in their case. Although nothing new whatever may turn up in the discussion, I believe if this suggestion is heeded, things new and old with regard to the best time and mode of applying farmyard manure and artificials may appear to one or to another in a more clear and definite point of view than before: all will be confirmed in good practice, and some perhaps be induced to give up what is questionable or unprofitable, and we shall not have spent an altogether unprofitable evening together. Our practice as regards the best time and most approved mode of restoring fertility to the land by means of manures evidently must greatly be modified, according to the chemical composition and properties of the fertilizers which we wish to employ, the chemical and physical properties of the soil, and the requirements of the plants which we wish to cultivate. In order to be of any practical use, agricultural matters should be treated rather in detail than in a general way. It may be very useful to a country gentleman to have some general ideas of farming; but I very much question whether such ideas alone would be of much use to the rent-paying farmer, who, amongst other particulars, must know exactly how and when to apply the various fertilizers which practice has pointed out to him as the most profitable for raising good crops of wheat, barley, or turnips. I therefore purpose to treat my subject less from a general or theoretical point of view, than to enter somewhat into details respecting the most approved modes and periods of applying manures to the land. In the first place I shall have to speak of the circumstances which ought to regulate the manner and the time in which farmyard manure is most usefully employed, and then it will devolve upon me to offer similar remarks on guano, bones, superphosphate, nitrate of soda, and a few other artificial manures.

Farmyard Manure.—The principal questions on the mode in which farmyard manure should be used, and the best time at which it should be incorporated with the soil, appear to be the following. Should it be used long and fresh? or short and rotten? Should it be carted into the field and ploughed in at once? or may it not be spread on the land, and ploughed in at the convenience of the farmer, without deterioration of its qualities? Is it desirable to distribute manure in a field in small heaps, and to leave it in that state for days or weeks? or should the manure be spread at once, and may it be left exposed to the air in such a state for some time, in case heavy rains should set in, and the wet condition of the land render the ploughing-in of the manure undesirable? What is the best time of the year for carting manure on the land? Should this be done in autumn or in spring? or may it be done at any convenient time, no matter what is the period of the year? To what crops of a rotation should farmyard manure be used, where a sufficient quantity is not produced for meeting the requirements of the crops intended to be grown and the deficiency has to be eked out by the employment of artificial manures? On all these questions great variety of opinions prevails. Allow me to state at once that I have always been an advocate for putting the manure on the land as soon as possible after it is produced, and that I believe autumn manuring as a general rule will be found more advantageous than spring manuring. It is not enough, however, merely to give expression to these convictions, for you will naturally expect me to support them by such proofs which will carry with them also conviction to your minds. In attempting to do this, I do not wish to weary you with chemical details; but it will be necessary for a clear understanding of the subject that I should speak as briefly as possible of the composition of fresh farmyard manure, and the changes which it undergoes in keeping or by exposure to the air. Chemically considered, farmyard manure has to be regarded as a universal and perfect manure. It is a universal manure, because it contains all the constituents which our cultivated crops require to come to perfection, and it is suited to almost every description of agricultural produce. As far as the inorganic fertilizing substances are concerned, we find in farmyard manure potash, lime, magnesia, oxide of iron, silica, phosphoric acid, sulphuric acid, hydrochloric acid, and carbonic acid; in short, all the materials, not one excepted, that are found in the ashes of agricultural crops. Of organic fertilizing matters we find in farmyard manure some which are readily soluble in water, and contain a large proportion of nitrogen; and others insoluble in water, and containing, comparatively speaking, only little nitrogen. The nitrogenous matters are principally present in the droppings and urine of animals, and yield ammonia on decomposition. The straw or litter in the manure hardly contains any nitrogen, and on decomposition produces brown vegetable organic acids, which pass under the name of humic acids. These organic acids—which, as we have just seen, are produced simultaneously from straw, with the ammonia arising from the putrefaction of excrementious matters—have a great affinity for ammonia, in consequence of which they fix it as readily as sulphuric or any other mineral acid. For this reason I may observe, in passing, that chemical fixers of ammonia are perfectly unnecessary in farmyard manure in which a due proportion of litter is used. Farmyard manure is a perfect manure, because experience, as well as chemical analysis, shows that the fertilizing elements are present in it in states of combination which seem to be specially favourably to the luxuriant growth of plants. As the number of chemical compounds in farmyard manure is exceedingly great, and some no doubt exist in a different state of combination from that in which they are obtained on analyzing farmyard manure, in our present state of knowledge it is impossible artificially to produce a concentrated, universal, and perfect manure which might entirely supersede home-made dung. By way of illustration, the subjoined tables, embodying the results of a careful recent examination of farmyard manure, may be given:—

COMPOSITION OF FRESH FARMYARD MANURE (COMPOSED OF HORSE, PIG, AND COW DUNG).

Water		66·17
* Soluble organic matter		2·48
Soluble inorganic matter (ash):		
Soluble silica	·237	
Phosphate of lime	·299	
Lime	·066	
Magnesia	·011	
Potash	·573	
Soda	·051	
Chloride of sodium	·030	
Sulphuric acid	·055	
Carbonic acid and loss	·218	
	——	1·54
† Insoluble organic matter		25·76
Insoluble inorganic matter (ash):		
Soluble silica	·967	
Insoluble silica	·561	
Oxide of iron, alumina, with phosphates	·596	
Containing phosphoric acid	(·178)	
Equal to bone earth	(·386)	
Lime	1·120	
Magnesia	·143	
Potash	·099	
Soda	·019	
Sulphuric acid	·061	
Carbonic acid and loss	·484	
	——	4·05
		100·00

I would direct special attention to the fact that fresh farm-yard manure, although it has a strong smell, practically speaking contains no volatile or free ammonia; and I may add that I have also found none worth mentioning in perfectly rotten dung; and, of course, where no free ammonia exists, chemical fixers of this substance are quite out of place. It is true ammonia is produced abundantly on the decomposition of the urine and solid excrements of animals; but it is equally true that during their decomposition peculiar organic acids are formed in the rotten straw, which effectually bind the ammonia and prevent its escape into the air. We have thus good grounds for maintaining that artificial fixers of ammonia are neither required for fresh nor rotten dung, and also for asserting that both fresh and rotten dung may be freely exposed to the air without loss in ammonia, for the former contains hardly any ammonia in any form, and the latter contains it in the form of ammoniacal non-volatile salts. Farm-yard manure, as is well-known, is subject to the process of spontaneous decomposition, which generally is called fermentation, but more appropriately putrefaction. The nature of this process consists in the gradual alteration of the original organic matters, and in the formation of new compounds. All organic matters, separated from the living organism, are affected by putrefaction, some more readily, others more slowly. Those organic

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* Containing nitrogen	·149
Equal to ammonia	·181
† Containing nitrogen	·494
Equal to ammonia	·599
Whole manure contains ammonia in free state	·034
Whole manure contains ammonia in the form of salts	·088

matters, which, like straw, contain but little nitrogen, on exposure to the air and moisture at a somewhat elevated temperature, decompose spontaneously and slowly, without disengaging any noxious smells. On the other hand, the droppings of animals, and especially their urine, which is rich in nitrogenous compounds, rapidly enter into decomposition, producing disagreeable-smelling gases. In a mixture of nitrogenous and non-nitrogenous matters, the former are always first affected by putrefaction; the putrefying nitrogenous matter then acts as a ferment on the other organic substances, which by themselves would resist the process of spontaneous decomposition much longer. The disagreeable-smelling gases which are produced during putrefaction arise from the sulphur and phosphorus of the nitrogenous compounds present in dung. A considerable proportion of this sulphur and of the phosphorus combines with hydrogen, and form, sulphuretted and phosphoretted hydrogen—two extremely nauseous gases—which both escape from fermenting dung heaps. The relative proportions of inorganic to the organic matters in well-rotten dung is much greater than in fresh. This increase in mineral matters can have only been produced at the expense of organic substances, the quantity of which during the process of fermentation must decrease in a corresponding degree. Thus whilst I found in fresh dung, dried at 212 degs. Fahrenheit, organic matters 83·48, inorganic substances 16·52 per cent., rotten dung shows in 100 parts, organic matters 68·24, mineral or inorganic matters 31·76. It is clear, therefore, that during the fermentation of dung much of the organic substances must become changed into compounds which are readily soluble in water and easily washed out by heavy rains, or into gaseous products which are readily volatilized. In point of fact, both volatile gases and readily soluble organic and inorganic compounds are formed. By far the largest proportion of the gases which escape into the air consists of carbonic acid gas, oxide of carbon, and light carburetted hydrogen, or marsh gas; and it is worthy of special notice that no appreciable amount of ammonia is dissipated. Now this is not a mere assumption, but a fact which can be readily ascertained by any one who has the skill of discerning the amount of ammonia with accuracy. The practical result of the changes which take place in fermenting dung is, that fresh manure in ripening becomes more concentrated, richer in nitrogen weight for weight, more soluble, and consequently more easily available to plants, and more energetic in its action. In proof of these facts I subjoin an analysis of rotten dung which I made many years ago, and which may be compared at your leisure with the preceding one of fresh dung. You will not fail to notice that rotten like fresh dung hardly contains any free ammonia, but much ammonia in the state of soluble ammoniacal salts, and that it also is very much richer than fresh dung in soluble, organic, and mineral matters.

COMPOSITION OF WELL-ROTTEN DUNG.

Water...		75·42
* Soluble organic matter		3·71
Soluble inorganic matter (ash):—		
Soluble silica	·254	
Phosphate of lime	·382	
Lime	·117	
Magnesia	·047	
Potash	·446	
Soda	·023	
Chloride of sodium	·037	
Sulphuric acid	·058	
Carbonic acid and loss	·106	
		1·47
* Insoluble organic matter		12·82
Insoluble inorganic matter (ash):—		
Soluble silica	1·424	
Insoluble silica	1·010	
Oxides of iron and alumina, with phosphates	·947	
Containing phosphoric acid...	(·274)	
Equal to bone-earth...	(·573)	
Lime	1·667	
Magnesia	·091	
Potash	·045	
Soda	·038	
Sulphuric acid	·063	
Carbonic acid and loss	1·295	
		6·58
		100·00

* Containing nitrogen ... ... ·297
Equal to ammonia ... ... ·360

The percentage composition of fresh and rotten manure, however, does not throw much light on the question whether dung sustains any loss in ammonia during ripening, and to what causes are really due its deterioration by exposure to wind and weather. But if a given weight of manure is put up in a heap, and its composition ascertained from time to time, and its loss in weight is simultaneously determined, then it is clear it is possible to ascertain whether the rotten dung which is produced from a given weight of fresh contains the same, or less, nitrogen than was originally present; and, by exposing the rotten dung afterwards to heavy rains, we can also determine the reason why it deteriorates so rapidly under their influence. This I have done a great many years ago. Two cart-loads of fresh farmyard manure were placed in a heap set against a stone wall, but otherwise exposed to the influence of the weather. The results of the periodical weighings and analyses are incorporated in the following table:—

TABLE SHOWING COMPOSITION OF THE WHOLE HEAP OF FRESH FARMYARD MANURE, EXPRESSED IN LBS.

	When put up. Nov. 3, 1854.	April 30th, 1855.	Aug. 23rd, 1855.	Nov. 15th. 1855.
Weight of manure in lbs. ...	2838	2026	1994	1974
Amount of water in the manure	1877·9	1336·1	1505·3	1466·5
Amount of dry matter in the manure...	960·1	689·9	488·7	507·5
Consisting of—				
*Soluble organic matter ...	70·38	86·51	58·83	54·04
Soluble mineral matter ...	43·71	57·88	39·16	36·89
†Insoluble organic matters ...	731·07	389·74	243·22	214·92
Insoluble mineral matter ...	114·94	155·77	147·49	201·65
	969·1	689·9	488·7	507·5
*Containing nitrogen	4·22	6·07	3·76	3·65
Equal to ammonia	5·12	7·37	4·56	4·36
†Containing nitrogen	14·01	12·07	9·38	9·38
Equal to ammonia	17·02	14·65	11·40	11·39
Total amount of nitrogen in manure	18·23	18·14	13·14	13·03
Equal to ammonia	22·14	22·02	15·96	15·75
The manure contains ammonia in free state	·96	·15	·20	·11
The manure contains ammonia in form of salts, easily decomposed by quick-lime	2·49	1·71	·75	·80
Total amount of organic matters	801·45	476·25	302·05	268·96
Total amount of mineral matters	158·15	213·65	186·65	238·54

* Containing nitrogen ... ... ·309
Equal to ammonia ... ... ·375
Whole manure contains ammonia in free state ·046
" " form of salts ·057

Without entering much into particulars, I may observe that, in the first experimental period, the fermentation of the dung proceeded with rapidity, but was unattended with any material loss of ammonia, nor, indeed, any appreciable amount of the more intrinsically valuable constituents of dung. At the end of April (as will be seen), the whole heap contained almost precisely the same amount of nitrogen which it contained when put up fresh in the preceding November. During that period, little rain fell, and this never in large quantities at a time; whilst in the interval of April and August rain was more abundant, and fell several times in continuous heavy showers. In consequence of this, soluble matters in the heap were washed out, and with them a considerable portion of available nitrogen and the more valuable mineral constituents of dung were wasted. The general conclusion which may be drawn from these experiments is evidently that manure loses no valuable fertilizing matters by simple exposure to dry air, and, I may add, nor even by exposure to a broiling sun, but that it is rapidly deteriorated by rain. Now, it is upon these undeniable facts that I found an argument for carting the manure on the land as soon as it can be done conveniently. Once placed there, neither sun nor wind will hurt it, I believe, in the slightest degree; and when rain falls, the soluble matters will be washed into the soil, where they are wanted, and stored up there for the use of plants; for all soils—some in smaller, others in larger, degree—as is well known, possess the power of absorbing and retaining, in a comparatively speaking insoluble condition, the more valuable soluble fertilizing constituents of dung. If the manure is carted on the field during the autumn or winter, and spread at once, it will even when perfectly fresh become sufficiently decomposed by the time it is required by the spring crops, and the unnecessary expense of putting up manure in heaps, and turning them over once or twice, and the loss attending such turning, may be entirely avoided; and this may be done at a time when the horses have little or nothing to do, and the fields are not injured by the horses' hoofs. I advocate autumn and winter manuring because autumn and winter, generally speaking, are the most convenient periods for carting manure. There is, however, not the slightest reason why this may not be done at any convenient time throughout the year; for, as I have said before, not even a broiling sun dissipates any valuable fertilizing matter from manure. Many persons, if I am not mistaken, entertain rather erroneous views with respect to the desirability of ploughing-in the manure directly it is carted on the field. I have, of course, no fault to find with this, if their anxiety to plough-in the manure directly arises from the wish that whatever can be done at once should be done without delay; but if this is due to the fear that manure, if not ploughed-in directly, will lose in fertilizing quality, I cannot share their anxiety; and go so far as to say that often it would be much better to leave the manure freely exposed on the land in wet weather, than to plough it in, and make a mess on the land when horses and men ought to be kept from it. Others take a middle course, and distribute the manure in small heaps, and leave it in this state until a convenient time occurs for spreading and ploughing it in. Now this, I do not hesitate saying, is an objectionable practice; for if heavy rain should fall continuously for a number of days, these small heaps will be washed out—at least partially, in consequence of which the portions of the field where the heaps were placed will receive too much of the soluble and most fertilizing matters, and the crops there become too rank, and the produce on the field will ripen unequally. I have observed over and over again the injury which may be caused by the objectionable practice of distributing manure in small heaps on the land, and leaving them for weeks together before spreading the manure. I would therefore advise the manure to be carted on the field whenever convenient, to spread it directly, and not to trouble about ploughing it in at once if rain should set it, even if the wet state of the land should render it advisable to keep horses and men from it for weeks or months. The views which I have advanced, I am aware, are not accepted as correct by some agricultural authorities. Thus, for instance, I find in an article on the farming of Leicestershire, in the last vol. of the *Journal* of the R.A.S., the following passage: "Lord Berners puts great stress on covering up the manure when laid in small heaps on the land, and cites an instance where the labourers were overtaken by a thunderstorm while manuring for roots, the ridges being opened and the dung carted on and laid in small heaps. A portion was covered with soil previous to the storm, and the remainer left for a few days exposed, the manure and treatment being in every other respect the same; but the difference in the crops was most astonishing. Where the manure was covered the produce was nearly double. Nor did the difference end with the root crops, for the barley succeeding was also very much better on the covered manure. This scarcely accords with the scientific conclusions of Professor Voelcker, who does not anticipate harm from exposing manure if spread on the ground. Lord Berners, however, is far too practical and acute an observer to allow us to have the slightest doubt as to his accuracy, and this is one of the instances where the teachings of science and the facts of practice cannot be easily reconciled." In explanation of this passage, I would observe that I have not the slightest doubt about the accuracy of Lord Berners's observation; but that I cannot recognize in it either an instance which shows that the teachings of science and the facts of practice cannot be easily reconciled, nor a proof that manures sustains any loss by evaporation. Incidentally I may also observe that I never taught to leave manure in small heaps in a field, but that it should be spread out at once. The real cause why, no doubt, Lord Berners got a bad mangold and barley crop on that protion of the field where the labourers were overtaken by a thunder-storm appears to me a very simple one. The field was a heavy clay land, and therefore it is not at all surprising that where the manure was got on the land and ploughed-in before the rain interfered with the operation, the mangolds and succeeding barley were good, and these crops turned out bad on the other portion of the field simply because the land was messed about after the thunder-rain, and not because the manure lost in quality by exposure to the air. At all events it is a fact well known to clay-farmers that on stiff land a better crop is often obtained without any manure when worked dry than with manure when worked wet. With regard to the crops to which farm-yard manure is best applied, I would observe that time does not permit me to dwell on particulars, I therefore will only notice that on farms on which farm-yard manure is scarce, and recourse must be had to artificials, the most economical plan to use the manure appears to be to grow the root crops mainly with artificial manures and to spread the yard-dung on the seeds or clover-lay. I now must hasten on, to offer very briefly some observations relaring to the manner in which some of the more important artificial manures should be used on the farm. All concentrated manures, such as guano, nitrate of soda, or superphosphate, should always be mixed with some diluent or the other, and applied in a finely-divided state. Artificial manures may be conveniently divided into nitrogenous and phosphatic manures. The former, as is well known, are specially useful for cereals and grass crops, and the latter for root crops. Concentrated nitrogenous manures, such as guano, nitrate of soda, sulphate of ammonia, &c., I am of opinion should never be ploughed-in deep, or applied with the drill, but be spread, properly diluted with dry and fine soil or burnt clay, vegetable ashes, or sifted coal ashes, by hand, or better by the broad-cast distributer, and harrowed-in very lightly. Superphosphate and bone manures, on the other hand, should be drilled-in at the time of sowing the seed. When the land is very light, or out of condition, so that rather a heavy dose of manure is required, it seems to me advisable to sow a portion broadcast, and to drill-in the remainder of the manure with the seed. The state of preparation in which artificial manures are sold by dealers often is not what it ought to be, and particular care should be exercised by the farmer not to use any which are wet, lumpy, or otherwise badly-prepared. This remark applies specially to bone-superphosphate. Even some of the most respectable manure manufacturers, I find, sell badly-prepared bone manures—that is to say, manures in which pieces of bone an inch long and longer, and scarcely acted upon by acid, are plainly visible. This arises from a desire to convey the impression that the manure is made from bone; frequently, however, so-called bone-superphosphates are in reality made from mineral phosphate and acid, to which a few plums of bone have been added. But, even should the manure be made entirely from bone, it would be far better if it were thoroughly disintegrated, and sold in a dry pulverulent state. As regards the quantity of superphosphate useful for root-crops, I may mention that sometimes mistakes are made by employing too much. As a general rule, 2½ to 3 cwt. of a really well-made and good superphosphate appears to me an amply-sufficient quantity for raising a good crop of turnips or swedes, on land in a fair agricultural condition, provided the superphosphate is properly diluted with ashes or dry soil before drilling, or applied with the liquid manure drill. Considering the great advantage of distributing much more uniformly turnip manures by means of the liquid-manure drill than by the dry drill, I am surprised that the former implement has not superseded to a greater extent the employment of the latter. There can be little doubt that where water is at hand the application of superphosphate by means of the liquid manure would effect a great saving in the purchased manure, for we possess trustworthy experiments which show that half the usual quantity of superphosphate gave as large a crop of roots as double the quantity applied with the dry drill.

Bones.—Bones in the shape of ¼-inch and even ½-inch pieces are still used by some farmers. I do not think this is the most profitable plan of applying this important fertilizer to the land. As long as bone-dust was comparatively cheap, and prepared bone-manure dear, the practice of using bones in a raw condition was perfectly defensible; but at the present time the altered circumstances of the manure trade will have the effect of superseding more and more completely the use of ¼ or ½ inch bones. Even for permanent pasture I believe bones partially dissolved by sulphuric acid, will be found more profitable than raw bone-dust. It is true the latter lasts longer than the former; but it should be borne in mind that the purpose for which manure is put on the land is not that it should remain there, but that it should produce heavy crops. Now, bone-dust requires a season or two before its action becomes manifest in the increased produce, and all the while the capital invested in the purchase of the bones remains on the land without bearing much interest, which surely cannot be an advantage. "Quick returns and small profits" should be the motto of the enlightened agriculturist, if he wishes to make the most of purchased manures. The profits of farming, I believe, in comparison with those realized in other pursuits of life, are, and probably always will be, small; hence, the greater the necessity appears to be to secure quick returns, and not to lock up capital uesless in the soil. I would, therefore, sugges the addition of about 20 or 25 per cent. of sulphuric acid, which will make a portion of the bone-dust soluble, and directly available for the use of plants. The addition of acid to bone-dust, moreover, in localities where crows abound, effectually prevents the depredations of these feathery marauders, who, it is well known, will carry off a good many bits of bone-dust from recently-boned pastures.

Nitrate of Soda.—Nitrate of soda is usefully mixed with about double its weight of common salt before sowing; 1½ cwt. to 3 cwt. of salt is a fair top-dressing for wheat or barley. Top-dressings with nitrate of soda should never be used in winter, but delayed till about the beginning or middle of March. The precise time when nitrate of soda should be put on the land depends on the more or less advanced state of the season, and the proper time of using this top-dressing I found, by many years' actual experience in the field, is the period when the young wheat-crop is just beginning to make its first perceptible start in spring. I have used nitrate of soda as late as the middle of April with advantage, and in other years as early as the middle of February with equally good effects. If there is a fair prospect of March being a moderately dry month, I should not hesitate to top-dress with nitrate of soda as early as the end of February; but should the weather at that time and in March be very wet, I would delay the application of nitrate of soda till the beginning, or even middle of April. There are two good reasons why nitrate of soda should be applied to the land in spring and not during the winter months. First, experience has shown the period pointed out by me to be the best; secondly, it is well known that no soil, whatever its composition may be, has the power of absorbing and retaining nitrates; and these highly soluble salts, therefore, are quickly washed away by the rain into the subsoil, where they are not wanted, if they are applied to the land during the winter or early part of spring; and hence it is only reasonable to delay top-dressings with nitrate of soda until the time when the wheat begins to make its first perceptible spring growth. It is well to bear in mind, that soils do not possess the property of fixing nitrates. Unlike salts of ammonia, nitrates pass unchanged through the soil into the drains, and are lost to vegetation in a great measure, if they are applied to the land in autumn or winter.

Ammoniacal Manures, such as sulphate of ammonia and guano, on the other hand, are best used in autumn or during winter, and not too late in spring. Even on light land, it is not desirable to apply guano too late in the season for corn-crops. Autumn-dressings with guano generally produce more healthy and equal crops than when manured in spring; and, as all soils without exception possess the power of absorbing ammonia from soluble salts, guano, sulphate of ammonia, and other ammoniacal manures, may be applied during the winter, without risk of losing valuable fertilising matters.

In conclusion, allow me to throw out a few hints as regards the mode in which guano should be applied to the land. Much more care should be taken than is bestowed upon it, to apply it in a good mechanical condition. Guano should never be sown without having been first sifted, and any hard lumps in it reduced to powder. It is a good plan, before sowing, to mix the sifted guano with about an equal weight of salt and double its weight of dry soil or ashes. Salt is a useful distributing agent of the fertilising constituents of guano in the soil, and, moreover, prevents the dusting and loss of finer particles of guano during sowing, in the field. The mechanical preparation of guano is not quite so easy an operation as some imagine; and this, I believe, is the reason why very few farmers perform it properly. Allow me briefly to describe a plan which I have found to answer well in preparing guano for use: First sift off all the fine guano-dust. Then mix the hard lumps left in the sieve with about twice their bulk of sharp sand. Spread the mixture on an even floor, and pass a heavy garden-roller over it, or beat down the lumps with a wooden mallet. (The admixture of sand prevents the caking of the guano, and greatly facilitates its reduction to fine powder.) After the whole has gone through the sieve, add salt in the proportion of two parts, by weight, to one of guano. The moisture imparted to the guano by the salt prevents the dusting, which is a great inconvenience in sowing by hand. Salt in conjunction with guano, moreover, has a specific action on vegetation, which is specially beneficial to corn-crops on light soils. I cannot too strongly impress you neither to spare trouble nor expense in preparing guano properly before sowing it: ten shillings or fifteen shillings, or even a pound, per ton will be well laid out, should the labour of preparing it in the way suggested by me cost as much. Peruvian guano contains no more than three-fourths to one-and-a-half per cent. of free ammonia; and hence there is no necessity of adding sulphuric acid to it, with a view of fixing the ammonia. Nevertheless, the addition of sulphuric acid to guano can be strongly recommended, for the reason that it greatly increases the chemical efficacy which this manure is capable of producing in the field. As little as ten or fifteen per cent. of sulphuric acid, added to guano, I find, has an extraordinary effect upon its composition. Sulphated Peruvian guano, on account of the large amount of soluble phosphate which it contains, is certainly more efficacious than guano in its natural condition, especially for root-crops. However, the mixing of guano and oil of vitriol, if I am not mistaken, is not a pleasant operation for the farmer, and I therefore do not advise you to attempt it; but if you will prepare your guano mechanically, in the way described just now, and then mix it with a good dry coprolite superphosphate, rich in soluble phosphate, you will secure all the chemical benefit which sulphuric acid itself produces on guano, much more conveniently, and thus be able to prepare, yourself, a really good-prepared guano, more economically than you can buy chemically-prepared guano. For root-crops, one of guano and three of superphosphate made from coprolites, and containing, as it should do, not less than twenty per cent. of soluble phosphates, is an excellent mixture, and a fair dose per acre. For cereals, the proportions of guano and superphosphate should be reversed—that is to say, one of phosphate and three of guano should be employed.

Mr. J. J. Mechi said he quite agreed with Professor Voelcker that it was a very bad and unprofitable practice to expose manure in dung-heaps to be fermented and have its valuable qualities washed out by rain. Where the covered-yard system was adopted no rain fell upon the manure, and no decomposition took place; and by putting it on the land at once they did with bullocks what they did with sheep, that is folded them upon the land. He could only suppose that dung-heaps originated in the difficulty of bringing straw into a fit condition to be worked into the land. When land had been folded with sheep no one ever lamented that there had been no dung-heaps to be turned over. When the covered-yard principle was acted upon, especially if the straw were cut into short lengths, the manure was in a proper condition to be applied to the land at any time they chose, and the proper time on heavy lands was when it suited their convenience. With regard to the clover-ley, his practice was, invariably after the first cutting, which took place in June, to cart the manure from the covered-yards and spread it immediately on the land. The result was a very large second crop of clover, which was folded off by sheep eating cake. Then, as the land was very saucy, he generally took a large crop of white wheat, which was followed by another large crop of Revet wheat (laughter). Gentlemen might smile at that; but he had over and over again, on stiff Essex clay, taken six or seven quarters of white wheat of good quality, and that was followed up by from six to eight quarters of Revet wheat (renewed laughter). It was not a laughing subject, but a very serious one. He could only say that in 1864 and 1865 the two crops taken on the clover-ley thus treated amounted to 15 quarters an acre of wheat. That proved, at any rate, that when manure was taken from the yards and spread out under the hot summer sun in July, or late in June, on the clover-ley from which the hay crop had been removed, all the manuring qualities were applied to the land. Instead of being washed away by the heavy rains of winter from dung-heaps, the whole of the valuable substances went into the soil. He could confirm what the Professor had said as to the impropriety of leaving small heaps of dung on the land. When dung was carted on the land it should be spread at once without reference to the time at which it was to be ploughed in; for if that were not done it would adhere so that it could not be afterwards spread until rain had fallen. He should be glad to know whether the Professor agreed with Baron Liebig that the bottom soil could not be manured through the top soil. The Baron said that poor clays were so greedy and so deficient in manure that nearly all the manure was appropriated by the first few inches of ploughed soil. Perhaps that accounted for their not being able to take red clover more than once in eight years; and he believed that even swedes could not be taken as often as they used to be, in consequence of the absence of food in the subsoil. He might add that a Swedish gentleman had lately told him that in his country farmers never attempted to take swedes oftener than once in eight years.

Mr. C. S. Read, M.P. (Honingham Thorpe, Norwich), said Professor Voelcker had told them that farmers' profits were not large; but he was inclined to disbelieve that, after what they had just heard (laughter). If farmers' profits generally were not large, the profits of Tiptree Farm must be very considerable (great laughter). With regard to autumn manuring, he thought a great deal must depend on the nature of the soil. Whereas the application of farmyard manure in the autumn to clay soils was very beneficial, he must say that on the other hand he had generally found that the application of manure at that season to light land was rather the contrary (Hear, hear). Mr. Mechi had told them that when they folded sheep, they did not want a dung-heap; but he (Mr. Read) knew well that if they fed off a certain quantity of turnips in November, about one-half the same quantity fed off in March would produce an equally good result. He was now speaking of course of very light soils; and he was quite sure that, however difficult it might be to manure the stiff subsoils and heavy clay of Essex, there would on the light lands of Norfolk be no difficulty in having the particles of manure applied in autumn washed into the gravelly subsoil by the winter rains. There was one question which he (Mr. Read) wished to put to Professor Voelcker. The Professor said they should apply manure to the clover ley. Was it, he would ask him, best to apply it to the young seeds in winter, or after the clover was cut, which Mr. Mechi said was his system? As regarded nitrate of soda, he thought that if his friend Mr. Hudson wished to apply a large dressing, he would divide it into two. They could not tell in February what kind of weather there was going to be; and hence it was the general practice in Norfolk to apply half the dressing in the last week in February, and the other half in the first week in April.

The Rev. E. Smythies (Hathern Rectory, Loughborough) said much difference of opinion existed in this country as to whether the greatest benefit would be obtained from spreading manure on the surface either of strong or of light soils, but particularly the former, or from ploughing it in immediately. It was well known that in many parts of the country, and especially in the midland counties, it was the practice, in regard to clay soils, to spread manure on the soil, and allow it to lie there for months before ploughing it in. A very strong impression prevailed among enlightened farmers that that practice was erroneous; and he confessed that he had been convinced by reading an able work of Mr. Chandos Wren Hoskyns, relating to clay soils, that it was best to plough in at once. That was a point on which they required the aid of science; but it had appeared to him that spreading manure on the surface resembled shallow draining, which did a certain amount of good, but not the greatest amount that might be realized (Hear, hear). The opinion of some chemists seemed to differ from that of Professor Voelcker: they seemed to think the best practice was to plough in at once, inasmuch as nothing tended so much to fix the valuable constituents in the soil as the soil itself. As there was a great diversity of opinion and of practice in that respect, he should be glad if the learned Professor would offer some explanation on the point. The Professor seemed to think there was no loss from spreading manure on the surface. Would he, then, say that if rotten manure lay on the surface—and, of course, manure must to a certain extent be rotten in the month of July—if it were spread on land for wheat or any other crop, and left there for a considerable time, there could be no loss from that cause? Of course, farmers often had to consider the question of convenience; they had to do the best they could, and not merely what was best in the abstract (Hear, hear); and he should be glad if the Professor would tell them how he thought they could most advantageously manure strong clay soils in such a winter and spring as they had in the early part of this year (Hear). Would he tell them how, in such weather as that which prevailed at that period, they were to avoid working their horses to death, and reducing the land to a condition in which it was fit for little more than to make bricks (Hear, hear)?

Mr. JOHN HUDSON (Castle Acre Lodge, Brandon, Norfolk) said before the learned Doctor gave them his reply, he hoped they would excuse an old man who had turned 70 for giving a little of his own experience (cheers). He concurred very much in what Dr. Voelcker had said with regard to the time and manner of putting manure upon the land. He believed they hunted a great deal in couples in that respect. He had always found that when manure was put on the land and spread immediately, it acted very differently from what it did under Lord Berners' system of applying it—covering it up in heaps, and not suffering the worms to pull it in. Why they knew that if they spread it on the land the worms would in a few nights have a great deal of it in. The worms showed by what they put up what they would take into the land. He firmly believed that if the manuring of their clover leys in preparation for their wheat crops were done early, the result would be so much the better. He had never found the sun produce any detrimental effects. He had some very tenacious land in Norfolk. There was a farm which was bought by his father in 1826, and which he had occupied ever since. It had grown wheat and beans alternately during the whole period; and as long as he could grow 5 quarters per acre of either crop he should not change his system (Hear, hear). He had had manure for beans lying on the land for six weeks before it was ploughed in, and he had never found manure producing so good a crop when it was ploughed in immediately. With regard to what Dr. Voelcker called artificial manures, he would rather that name were changed to fertilizers; for there was in fact nothing artificial about them. He thought the Doctor was right as to the time at which they should be applied. He (Mr. Hudson was not now a great advocate (though he was some time ago) for applying nitrate of soda in large quantities. He preferred mixing a little nitrate of soda with 2 cwt. of Peruvian guano and 2 cwt. of salt an acre for the wheat crop; and he would rather apply this mixture in two dressings than in one. If, indeed, they could tell what the weather was going to be in the last fortnight in June and the first fortnight in July, they might grow almost what they liked; but they could not know that; and in trying to get what their friend Mr. Mechi did—namely, six or seven quarters per acre—they might get only three. If the season were a dry one, they might be able to grow as much as Mr. Mechi; but if there should be a great deal too much wet, even he might find that he had too much straw and too little corn (laughter). He (Mr. Hudson) wished to ask the Professor whether he did not consider it desirable to mix a small quantity of superphosphate or dissolved bones with Peruvian guano before it was sown for wheat? He had himself done that with good results. He did not know that it would answer in every season; but he had tried it two or three times with advantage. He threw this out in the hope that other people would try the experiment as well as himself. There was an article called "phosphate guano;" but he did not suppose it was anything else but superphosphate mixed with guano, and that was a mixture which they could make for themselves (Hear, hear). As regarded manure for wheat, he had found that when he had applied farm-yard manure in October, and ploughed it in immediately, it had not done half so much good as when he applied it in September, and left it exposed for the rain to fall upon and the worms to take it into the ground. It could not be put on too soon after the first crop of hay was off. To put the manure on as soon as possible, and let the second crop be well grown before it was fed off, was, he believed, the best preparation they could have for wheat.

Mr. E. EDMUNDS (Rugby) said that there seemed to be considerable anxiety to put the manure out of sight. In his district the great difficulty was to keep manure at all. What was found to answer best was to keep the manure as near as possible to the surface of their hungry soils. He had ploughed-in farm-yard manure in the autumn for turnips and mangolds, but this did not succeed—it was gone when wanted for the crop. He had grown the best crops of turnips and mangold by this practice. He liked to have his land ploughed six weeks or two months before the time for ridging, about the last week in April for mangold, the last week in May for swedes. He opened the ridges. He then applied 15 or 20 tons to the acre between the ridges; he then sowed broadcast a mixture of 2 cwt. superphosphate, 1 cwt. guano, and 1 cwt. salt (for mangolds he used 3 cwt. salt); the ridges were then closed, rolled down, and sown with all his care. When the time came for sowing barley in the spring, scarcely any trace of the farm-yard manure can be found.

Mr. JAS. EVERITT (Eaton House, Norwich) said it might appear presumptuous in him as a Norfolk man, and a new member, to say so, but he could not help thinking that it would be better for them to act upon their own experience than upon any theory which they might hear that evening (Hear, hear). He would defy any chemist to lay down a rule which would be applicable universally throughout the kingdom. His own experience, in some measure, coincided with that of his friend Mr. Hudson. He had always found that a mixture of artificial manures had produced the most beneficial results. He did not think any artificial manure used by itself, on soils which he had occupied now for nearly forty years, would produce the same result as an admixture of guano, superphosphate, small fine-bone manure, and a moderate quantity of rape cake. That combination he had tested practically, and he had found the best effects from them on the light lands of Norfolk.

Mr. P. H. Frere (Cambridge) said as regarded the best time for applying manure, he thought they were all agreed that the stiffer the soil the earlier it should be applied. With respect to the mode of application for roots, his attention had lately been called to the fact that the roots of plants mainly took up their nutriment from the first sucker at the end of the root, and that they diverged and radiated as they went out from the small original germ; and that being the case, it would be unwise to manure close to the seed for turnips. The hoeing of the turnips would pretty well diffuse over the intervals between the drills the manure which was first deposited in the drills. Therefore for the convenience of the turnip crop he thought they should apply the manure in the drill, leaving it to the man who singled the plant to distribute it over the surface. But the case was different as regarded coleseed or rapeseed. These were not singled, and therefore it would be best, he thought, to apply the manure broadcast. On the lighter part of his land the soil was so sandy that he could not grow even white turnips in a dry season. Hence he grew rape; but this year he had grown white turnips along with the rape, and with satisfactory results. Although this last year had been rainy, in the dry part of England white turnips sown alone on dry land had not done well; the leaves had been shrivelled up, and there had been very little feed in the root; but when white turnips were mixed with the rape there was a great deal of feed—in fact, much more than he could possibly have imagined there would be. He threw this out for consideration in relation to sandy land.

Mr. James Howard (Bedford) said: He thought it due to Professor Voelcker that he should mention one fact. Upon his recommendation some years ago, he applied dissolved bones to wheat in autumn instead of in spring, and he had every reason to be satisfied with the advice he received. On strong lands there was no comparison between the result of applying dissolved bones in the autumn and the result of applying them in the spring. There was one other fact of which he had been reminded by the discussion. One of the most practical and the best managers of light land that he ever knew was his own father-in-law, who farmed his own estate in Essex. He invariably put his farm-yard dung on clover leys in the month of July, and maintained that there was a difference of 8 bushels per acre between applying it then and putting it on at Michaelmas. He was a thoroughly practical man, quite innocent of anything like science (laughter). He (Mr. J. Howard) thought they would all agree with him, that not only the Farmers' Club, but the farmers of England owed a deep debt of gratitude to Professor Voelcker, for coming forward from time to time, to pour out from the stores of his knowledge for their benefit (cheers).

Mr. L. A. Coussmaker (Westwood, Guildford) was glad to find that the practice which farmers had followed on clay land, of carting their manure to the land when they could do it most conveniently, was not far wrong. On light lands a man might cart his manure when he pleased, and plough it in immediately; but on heavy clay lands they were obliged to cart at a time when it would not injure the land. The effect of carting manure on such lands when the weather was very wet was, as it was termed in his county, to podge the soil, and carting then did more harm than the manure good. Hence the practice, generally speaking, was, to cart the manures in the autumn, spread them as soon as they could, and plough them in at leisure. That might not be the most desirable practice; but clay farmers were obliged to adopt it.

Mr. Charles Howard (Biddenham, Bedford), said: There was a very strong opinion among some practical men in his county, with whom he was acquainted, against the propriety of putting on farmyard manure in very severe frosty weather; and as the Professor had not mentioned that point, he should be glad if he would do so in his reply. With regard to autumn manuring, his experience coincided with that of Mr. Read, that it did not answer so well on sharp gravelly soils. He had tried it for some years, but had found the manure tell better when applied nearer to the time of sowing. When Dr. Voelcker did him the favour to walk over his farm, upon a close inspection of the soil, recommended this course.

Mr. E. Little (Lanhill, Chippenham) said his object in rising was to ask Professor Voelcker a practical question, which, though not strictly in accordance with the wording of the subject, was intimately connected with it. Having suffered along with many of his neighbours from the rotting of roots grown with artificial manures, he wished to know whether the Professor could account for that serious evil. For the last two or three years the evil had largely increased, particularly in connection with the use of superphosphate of lime. Swedes and turnips had rotted to a great extent in the present year. He had a piece of land used for swedes, on which he mixed vegetable ashes with 3½ cwt. of superphosphate of lime, and the result was that one-third of the crop was rotten and not fit for use. He found that roots did not rot with farm-yard manure combined with a certain proportion of artificial manure. Whether the result in the other cases was owing to the use of too large a mixture of artificial manure with the ashes he could not tell; but when a small quantity of artificial was combined with a large quantity of farm-yard manure there was no sign of disease. The Professor had recommended them to give up in a great measure the use of bones (which was a favourite manure with him), on the ground that it took two or three years to bring out the value of that manure. He differed from the Professor on that point. He had found of late years that when he used superphosphate he did not get so great a quantity of barley or clover as resulted from the use of bones, nor did he think the wheat crop was so good. He believed that bones were as good a manure as they were twenty years ago, and he intended to continue using them.

The Chairman thought the time had now come for terminating the discussion. He was quite sure they must all agree with him in thanking the Professor for one of the most scientific and practical lectures ever delivered. It often happened that Professors gave lectures that were merely scientific; but in this case the science was mingled with practice. They had, indeed, benefited already, and they would no doubt benefit still more when they read and studied the paper. It would seem from the remarks of various speakers that the practice of putting manure on land in the autumn was very good on moderately strong land, but that when it was carried out on light land the manuring properties would be washed away. An opinion had, however, prevailed for some time that the damage done to manure spread on the surface arose from the wind and the sun; but what they had heard from the Professor had set their minds at rest on that subject, and practical farmers who had spoken in the discussion seemed to consider that the injury arose not from the wind and the sun, but from the washing away by rain. He had compared the results of ploughing-in manures and putting it on the surface, and he could never perceive any difference; and, therefore he did not believe any evil arose from exposure. He quite agreed with Mr. Read that turnips eaten off in the autumn did not do so much good as turnips eaten off in the spring when the manure was fresher. The smell given off from the sheepfold in the spring would lead to the belief that the sun and wind was taking away the best part of the manure; but experience showed that this was not the case, and proved that manure does not suffer from such exposure. In conclusion, he remarked that, with some exceptions, the opinions expressed by the practical farmers who had spoken that evening appeared to agree with those of Dr. Voelcker.

Professor VOELCKER then proceeded to reply. Mr. Mechi asked him whether he thought there was any truth in the observation of Baron Liebig, that farmers could not now grow any clover or root-crops so successfully as in former years, because the manuring constituents of the subsoil were exhausted? There was a great deal of truth in that. Many subsoils were now very poor indeed; but, nevertheless, he would not go the length of saying, with Baron Liebig, that they must manure the subsoil, but was rather inclined to think that the nearer the manure was kept to the surface-soil, the better. They should do all they could to keep the manure as near the surface as possible; for, somehow or other, the manuring matter constantly found its way into the subsoil. Now, if there were one thing which he was more anxious to avoid than another, it was the laying down any definite laws for the regulation of the practice of agriculturists. There could be no greater mistake than to prescribe the same rules even for the fields on the same farm (Hear, hear): they must modify their practice according to the character of the soil. What Mr. Sewell Read said about some light soils not holding manure for any length of time was perfectly correct. On the light soils of Norfolk, of the Lothians, and some other parts of Great Britain, it would, he believed, be well to manure just before the sowing of the crop which it was intended to grow. But, even with respect to the light soils, they might, and he thought ought to, modify their practice materially, according to the system pursued in managing the manure. On light lands, he should not have any great hesitation in carting perfectly fresh manure on the land early in the season, because in fresh dung very little of the fertilising matter was in a condition to be immediately available for the plant. On such land he would decidedly avoid carting rotten or turned-over manure in autumn; but he should feel less scruple in carting manure just as it came from the stable on to the land during winter, believing that it might be left on the land in that condition for some time without undergoing any serious loss. He believed that one cause of the poorness of subsoils was that many farmers did not work it sufficiently. There was a great deal of truth in what Baron Liebig said about the poverty of the subsoil. He thought the subsoil was often poor because it was not properly cultivated, and in an unfit state for the reception of manuring matters; and perhaps the best remedy against this evil was to work it well with the steam-plough. With respect to the proper time of putting manure on the clover ley, he still believed that it could not be applied too early. Even if it were applied in July, it would be all the better. As to the application of nitrates to light land, he would observe that he had seen very great benefit arise from dividing artificial manures, like nitrates or guano, into two portions. On very light land he had seen manifest advantage resulting from making the application of the top-dressing in two doses. He also agreed with his friend Mr. Hudson that nitrates—and this remark applied to nitrate of soda especially—should not be used very frequently on poor light land, and that on such land guano, especially if mixed with superphosphate and salt, was a better dressing for wheat. This was explained by the fact that guano was a more perfect manure than nitrate—a manure composed of various good ingredients, the benefits of which were more lasting; whereas nitrates passed through the land, and the good derived from them did not continue. So far from saying that nitrate of soda should be used on poor land or land out of condition, he would say, let it be used chiefly on good land. If it were used on poor land repeatedly, the benefit would soon come to an end. With respect to the application of dung to heavy land, he was perfectly satisfied that nothing was lost by evaporation—that neither the sun nor the wind nor frost would expel anything valuable from the manure when it was once put on the land. But, at the same time, it must be borne in mind that dung, when ploughed-in immediately on very heavy land, produced a mechanical benefit which ought not to be neglected by the intelligent farmer. On very heavy land he would certainly advise the ploughing-in of the dung as soon as possible, if the land were not too wet, for when that was not done on wet land the injury of ploughing it in during winter might be worse than that of not manuring at all. The mechanical harm that was done by the consolidation of stiff clay land was sometimes infinitely greater in amount than the good done by manuring it. Of course, if they could work a piece of land properly, and manure it at the same time, that would be the best; but when they had to choose between two evils, the lesser one ought to be preferred. In other words, manure ought, in such cases as he referred to, to be left on the land, and the treading of the land by horses and men avoided. Mr. Little put a question with regard to bones. He (Professor Vocleker) believed, with that gentleman, that bones were as good now as they ever were, and if they were as cheap as they were five or six years ago he would not use a particle of superphosphate, or of any prepared bones. But, as bones were at the present time getting dearer and dearer, they must try and make the most of them, and this would be done by partially dissolving them in sulphuric acid. Of course they could not expect to derive the same advantage from 3 cwt. of superphosphate of lime as they derived from a heavy dressing of good bone-dust. With respect to the rotting of roots, which he was aware was often seen where artificial manures had been applied to the land, he would observe that he thought the time at which the seed was sown had a great deal to do with the preservation of roots. Sometimes a fortnight earlier or later would make all the difference as to whether roots kept well in the land or not. Mr. Little observed that on land which was manured with farmyard manure roots did not go off so rapidly. This might be due to the fact that farmyard manure rather kept the early growth of roots in check than promoted it; whereas the application of special manures like superphosphate promoted an unhealthy growth, and brought on the young plant too rapidly. If it were not supported in its growth sufficiently, there would be a sudden check, and they well knew that plants could not, any more than animals, stand such a check. He quite agreed with one of the speakers that it was always a good plan to use artificials in such a way as to get as far as possible a mixture of the most valuable of various substances used by the farmer as manure. It was clearly better to do that than to depend on one simple manure. He thought he had now answered the several questions which were put to him, and he would therefore sit down.

Mr. C. S. READ, M.P., moved a vote of thanks to Professor Voelcker for his excellent paper.

Mr. T. CONGREVE in seconding the motion, said that after what fell from Mr. Mechi he regretted, for that gentleman's own sake, that Tiptree Farm did not consist of two thousand acres, instead of about two hundred; for, in that case, if the produce were anything like what he had described, he must soon become very rich (laughter).

The motion having been adopted,

Professor VOELCKER returned thanks; and, after passing a vote of thanks to the Chairman, the meeting separated.

WHAT IS THE FARMERS' CLUB?

Though the English farmer is still deprived of political freedom; though he has no action of his own in religious affairs, he has the liberty given him of getting as much out of his ground as he can, not forgetting at the same time the improvement he effects in his landlord's property. English agriculture has shared with all the other arts in the benefits of modern discovery and invention. Never was land so well cultivated as it is in England at the present hour. And the present race of farmers know a good deal more than their fathers of the sister-arts, and they read and think on scientific subjects; and they organize themselves into societies or "Clubs" for the purpose of comparing notes with each other as to their experience and their theories. *The* Club among them, which is emphatically the representative of the farmers throughout the country, was founded upwards of twenty years ago, I believe by the late William Shaw, who was for many years editor of the *Mark Lane Express.* It is called "The Farmers' Club." Its meetings are held six times a year in London, because the metropolis is the only rendezvous that the farmers would be at all likely to agree upon. The members come from all parts of the Kingdom, and among them are the very *élite* of English farmers. You hear in their discussions the burr of Lincolnshire, the broad accent of Essex, and the "h" sounds of the Somersetshire yeomen. Mainly they are tenant farmers, but some of them fill the double capacity of tenant and landlord. The late Fisher Hobbs was an instance. Landlords proper rarely come; and when they do, they never dine; and things are said which it is not agreeable for them to hear. The subjects discussed are of an eminently practical character. General politics are avoided. The usual course is for a paper to be read by a member who has undertaken one of the subjects for the year, and who is always expected to tell something which he knows from experience. A discussion then ensues, in which the questions raised are viewed from all sides, and the principles propounded, tested by the practical knowledge of farmers from every district. The Club rooms in which they meet are part of an hotel built by farmers for the accommodation of persons of their own class. An Illinois farmer on a visit to London would find himself, were he to take up his quarters in the Salisbury Hotel, Fleet-street, in the midst of brother cultivators, who would give him a warm reception, and assail him with a thousand eager questions upon his State, and his land, and his stock. For a new interest, if only a temporary one, has sprung up among the worthy agriculturists through a lecture given them on Monday night by Mr. J. Howard, of Bedford, a celebrated maker of agricultural implements, who, having just returned from the United States, where he visited Indiana, Ohio, Illinois, Iowa, Pennsylvania, New Jersey and the New England States, determined to lay before the Club the results of his observations in a paper called "Things in America."

THE FARMERS IN COUNCIL.—To hear this address the largest audience ever known in the history of the Club assembled. Since the war the United States has grown in our thoughts. America looms constantly before us. Not only the Irish peasant depicted by Mr. Bright, but thousands of cultivated Englishmen, wanting scope for their energies, "turn their eyes to the setting sun." And so we had a great gathering of farmers to listen to American facts, on Monday. For Mr. Howard, let it be understood that he had no anecdotes to tell; no "amusing" scenes to describe; but only plain business details, entering into the marrow of the lives of grave and earnest men. As a rule the proceedings of the Farmers' Club are not reported in the ordinary political journals, but an exception was made in this case, and the papers of yesterday contained an abstract of Mr. Howard's remarks. I have since had the pleasure of perusing the MS. of the paper, and note in it many things which are imperfectly given by our press. Mr. Howard, in a simple, manly way, paid a tribute to the American character which made a great impression upon his hearers. Without leaving room for the least suspicion of flattery, he yet gave a picture in which all the lineaments are favourable. As with every other traveller from Europe, the extent of the country excited his amazement. The figures, he said, "seem to dwarf Great Britain into a mere speck upon the map of the world." The extent of the information of the people was equally surprising, though as for every Englishman who has visited the United States he found ten Americans who had visited England. This was intelligible. He actually said that he found American farmers who knew more about English affairs than many English farmers do! Of another favourite theme of travellers from Europe he said: "I do not maintain that in point of personal manners they come quite up to the English standard, but any deficiency in this respect is more than compensated for by the absence of that stiffness and formality of the one class of England, and the extreme servility of the other." Again: "I do believe the American people have been misrepresented and traduced by some of our public writers, in a way that no other people on the face of the earth have been. I went to America with many of the prejudices of England, expecting to find at least the bulk of the people rough, 'rowdy,' uncouth, and vulgar. Dickens, the Trollopeses, and other writers might have met with the characters they have pourtrayed. I can only speak of the people as I found them. I travelled some 5,000 miles without once being subject to insults or rudeness of any kind. I mixed with all classes; for there are no first, second, or third class on their railways or steamboats—and I met with nothing but civility and politeness. The working class are well-behaved, and, as a rule, are far better educated and more intelligent than our own. The wealthier class I found to be communicative, open-hearted, and hospitable; indeed, as pleasant and agreeable people as I could wish to mix with." If he were asked what was the best part of the state to settle in, he should say one of the Northwestern States—Illinois, Iowa, Wisconsin, Michigan would be the best for corn-growing and stock-raising; but he was inclined to think that more money was to be made out of the vine and cotton, and that there was a fine field open in North Carolina, Texas, and California. The lecture bristled with facts and points illustrative of agriculture and of "things" generally in America.

After the paper had been read, a discussion sprang up, the principal interest of which turned upon the question—how far the United States, and more particularly the Northwestern portion and the Carolinas were desirable as settlements for the sons of British farmers. It was evident that to most in the room no *national* prejudice would interfere with what might appear prudent from a material point of view, and it was hinted that the subject might well form the staple of a discussion early in the ensuing year. The impossibility in which farmers are placed, of finding farms for their sons, is clearly causing them to think seriously of the openings in the West. Chicago was repeatedly spoken of—it was alluded to at length in the lecture itself—and among the speakers who dwelt upon the marvellous resources of its district and the vast expansion of the city was Mr. Wilkins, who, it appears, was for twelve years a British Consul in your midst. One or two American gentlemen spoke, but there was nothing in their remarks calling for notice.—*London Correspondent in Chicago Tribune, Nov. 25.*

[Mr. Howard read his paper on Monday, November 5th, and on Monday, December 10th, the *Chicago Tribnne*, with the above article in it, was laid on the table during the time Professor Voelcker was delivering his lecture.—EDITOR *F. M.*]

ROYAL AGRICULTURAL SOCIETY.—In connection with the approaching meeting of "the Royal" at Bury St. Edmunds, the Suffolk Agricultural Society has agreed to offer £540 in prizes, viz., £155 for Suffolk cart-horses, £195 for riding-horses, £35 for cattle, £30 for swine, £45 for sheep (Suffolk), £8 for butter, £8 for Suffolk cheese, and £40 for models of cottages. The cattle prizes are to be restricted to Norfolk and Suffolk breeds. The various prizes for horses range in value from £5 to £20 each.

THE PREVENTION OF THE CATTLE PLAGUE.

A deputation from the Central Chamber of Agriculture waited, on Monday, Dec. 17, on the President of the Council (the Duke of Buckingham), at the Privy Council Office, Downing-street, for the purpose of making known to him their views with respect to the course which it is desirable to adopt for preventing the spread of the cattle plague.

The deputation consisted of Mr. E. Holland, M.P., Mr. C. S. Read, M.P., and Mr. Pell.

Sir Stafford Northcote and Mr. Corry, M.P., were seated by the President of the Council throughout the interview.

Mr. Pell said there were two separate subjects which they wished to have considered, and they had already forwarded papers relating to them to the Privy Council and the Home Office. The first of those points was the nature of the arrangements at present in force for the regulation of cattle markets, and more particularly the Order of the 7th of November, which gave a power of licensing markets for the sale of cattle throughout the country. They had to express their regret that such an order had ever been issued; and they believed that it was calculated, if not directly, at least indirectly, to contribute to the spread of the cattle plague, by leading people to suppose that the distemper had altogether disappeared from this island, or had, at all events, become so mitigated that there was no necessity for continuing the measures which had hitherto been adopted for its suppression.

The President of the Council said he thought it right to remind the deputation that no market could be licensed in any county in which the disease still existed, or in any town where there was disease within ten miles of it.

Mr. Pell said he was aware of that; but he still thought that the issuing of the Order must be attended with some danger.

The President of the Council said that, in point of fact, the markets that might be licensed under that Order would be subject to stricter supervision as regarded the movement of cattle than that which prevailed under the regulations that had previously been in force.

Mr. Pell said that might be so; but he thought the general effect of the Order was to relax the vigilance of the dealers and owners of cattle, as well as of the officers charged with the administration of the laws.

The President of the Council said he believed the law was in many cases violated at present, and the question was whether it would not be advisable to give a power of doing legally and with proper safeguards that which had hitherto been done illegally and surreptitiously. There was this great advantage in the Order of the 7th of November, that if disease should break out among any one of a number of cattle taken to a market it would afford a means of ascertaining the quarter from which all those cattle had come, and the quarter to which they had been removed. In theory, no doubt, the absolute stoppage of the transfer of cattle would be the safest course to pursue; but he was not sure that, practically, the permission to remove cattle under careful supervision and restriction might not be found the more efficient mode of dealing with the case.

Mr. Pell said he would leave the matter to the further consideration of his Grace, and he would next pass to the recommendations which had been forwarded to the Home-office with reference to the permanent regulation of the cattle trade. Mr. Pell then read the recommendations of the Chamber as given in the report of the meeting last week.

The President of the Council asked whether by recommending that fat cattle should be slaughtered at the port of debarkation, the deputation wished that cattle intended for the metropolitan market should be limited to the port of London, and could not be landed at such places as Harwich or Southampton.

Mr. Pell replied in the affirmative.

The President of the Council wished to know, with regard to the watering of cattle, whether the deputation had formed any idea as to the length of time cattle might be left without water.

Mr. Pell said that would depend very much on the time of the year. But he thought that in winter they might safely be left without water for twenty-four hours.

The President of the Council here read a number of provisions which had been prepared for the regulation of quarantine and other details connected with the traffic in cattle.

Mr. Pell asked how long the quarantine was to last?

The President of the Council replied thas the time was to be left to the decision of the Privy Council; but it could not extend beyond 28 days. There was another point to which he wished to call the special attention of the deputation, and that was the great difficulty in which the Government were placed in consequence of the apathy and indifference of the local authorities to give effect to the restrictive provisions of the existing law. Without the co-operation of those authorities there would be little use in attempting to maintain the present regulations, and still less in adopting others of a more stringent character.

Mr. Holland said that in the counties the Quarter Sessions were the only authorities who could enforce the law, and it was impossible for them, in consequence of the extent of the areas which were thus placed under their supervision, adequately to discharge that duty.

The President of the Council said that he did not see how ny other agency, except the magistrates in Quarter Sessions, could be employed for that purpose, inasmuch as practically they alone had control over the police and the county officers. The absence of any efficient control and the difficulty of giving effect to the restrictions, at present formed a very important question.

Mr. Pell sta'ed that there was one mode in which dealers were at present enabled to evade the law. They got licences from three or four different magistrates in their neighbourhoods to convey the cattle to so many different districts, and if they did not succeed in disposing of them in one of those districts they conveyed them to another, and were thus able to drive them over extreme tracts of country, with the great risk of spreading the disease.

The President of the Council said he thought the police might see that the cattle were slaughtered at the place to which they had been removed under the first Order. But if any abuse of that description were practised he should be glad to be furnished with detailed evidence upon the subject, in order that measures might be taken for enforcing the law. There was no doubt that the mode of dealing with diseased cattle must again come under the consideration of Parliament, for there was no probability that the distemper would be so completely extirpated as to render unnecessary any supplemental legislation; and when the subject came to be further considered, the recommendations which had been offered by the deputation would, he felt convinced, be found very valuable.

Mr. Pell said that we were at present exposed to great inconvenience through the negligence of foreign countries.

The President of the Council said he was afraid the negligence was in a great degree to be attributed to our own authorities. He did not think that even in Holland there had been any evasion of the law which had led to the transmission to our shores of infected cattle. But there was a reason to apprehend that the law was habitually evaded in this country; and it appeared that in many districts the machinery for enforcing the restrictive system was no longer in force, while in the metropolis itself notice had been given that the employment of inspectors would be discontinued after the termination of the present month. He repeated that that negligence on the part of the local authorities created the most serious difficulty in dealing with the evil.

BEDFORDSHIRE AGRICULTURAL SOCIETY.—It has just been decided to hold the annual show of stock at Bedford on June 28, 1867. The ploughing match will be held at Bletsoe in October.

LAND IN AUSTRALIA.

Whilst in the United Kingdom it is found difficult to find land for purchase or rental, the reverse holds good in our various colonies; as waste land is there so abundant that its utilization and occupation are the great difficulties, and act after act is passed by the different legislatures to deal beneficially with this overplus and to attract population. The great island continent of Australia, and the adjacent islands of Tasmania and New Zealand, have as yet but the fringes of their territories occupied, while of the vast interiors much is even unsurveyed. In a political and social point of view, the allocation of the waste lands to practical settlers, whether for grazing or cultivation, is becoming daily more important. Of the vast territories of some of the Australian colonies, such as New South Wales, Queensland, and Western Australia, we have no reliable data. In Victoria, the crown lands sold and granted from its first settlement to the commencement of 1865, reached to 5,908,000 acres, and the amount of purchase money realized by the Government was £11,690,000. The extent of land remaining unalienated at the same date was 49,736,000 acres. Of this amount 28,826,700 acres were held under lease for pastoral purposes only by 1,161 occupiers, giving an average of about 25,000 acres to each occupier. The alienated land is nearly all in occupation. 17,679 holders were in possession of lots of over an acre in extent, the average to each being 314 acres. Nearly three-fourths of the alienated land is enclosed, but only an eleventh under cultivation. The area of Victoria is 86,831 square miles, or nearly as large as Great Britain. The total area of purchased land in South Australia is 2,894,000 acres, or 19.64 acres per head of the estimated population. Two-thirds of the land is returned as being in the occupation of freeholders. Twenty per cent., or one in every five acres of the purchased land, is under cultivation. In comparison with the respective populations, there is five times more land under tillage in South Australia than in the adjoining colonies, there being four acres for every man, woman, and child in the province, or twelve acres for every male of fourteen years of age and upwards. Seeing that in this division of the population only one-sixth are engaged in agricultural pursuits, it follows that an eighty-acre section can receive but little more than the continuous labour of one statute adult throughout the year.

The opening up of the land of a new country is always one of its chief difficulties, and this has been felt no less in Tasmania than in many other of the colonies. There are always persons to be found to contend for the perpetuation of the *status in quo*, however destructive to progress. If debased by the system of free grants, or by what is near akin to it, they will not listen for one moment to the land being sold at a fair and reasonable price. If the land be in a state of nature, they would not have it defiled by the presence of a surveyor's theodolite, or the touch of a surveyor's chain, but would have it left as it is until the greater portion is taken up by gentlemen whose only object is to convert it into vast sheep-walks or cattle pastures. In the prospective occupation of land so situated, the interest of the community at large is the very last thing to be thought of. And that is the way in which five to six millions of acres of land lying on the western side of the island of Tasmania has hitherto been dealt with.

The area of Tasmania, exclusive of the adjoining islands and lakes, is about $15\frac{1}{2}$ million acres, and with the islands and lakes, nearly $1\frac{1}{4}$ million acres more. The alienated land is only 3,400,000 acres; and taking the population at 95,000 souls, this gives rather more than 35 acres of alienated land for every man, woman, and child in the colony. But the unalienated land is the most remarkable feature. After making the largest conceivable deduction for comparatively worthless land and for lakes, there would still be room for four times the present amount of population with a similar liberal apportionment to that given above—35 acres to every man, woman, and child.

The number of grants of land made in that island in the last fifty years was 3,568, comprising, in all, 2,098,763 acres; the number of lots sold, 4,730, comprising 1,278,746 acres, realizing £970,596. Of town lands granted free, no correct return, it appears, can be made, the official records not being sufficiently perfect to admit of such a compilation. But the town lots sold in the last quarter of a century have been 7,049, comprising 25,000 acres, for £236,000. By the last Colonial advices, a new Waste-Lands Bill was about to be introduced into the Legislature, which would make important modification in the Waste-Lands Act of 1863. The object of the bill, we are told, is, "to give present relief to an industrious class, and to protect our hardy pioneers from the consequences of entering into engagements which they may not be able to fulfil, and at the same time to give increased facilities for settlement." Under these words, who would pretend to say what kind of meaning lies? What class is it that is thus to be relieved? Who are the hardy pioneers to be protected from the consequences of their own rash acts?

In the existing Waste-Lands Act, we find the following clauses under the head of "agricultural areas." First: "The Governor in Council may from time to time reserve from sale, and proclaim as an agricultural area, such land as he sees fit; and upon a road being made through such area to a main or cross-road, the sea, or a navigable river, the said area shall be divided into lots respectively containing not more than one hundred and sixty acres, and having a frontage on such road." Again: "The Commissioner may cause the said lots from time to time to be let by public auction for a term of twenty years at an annual rental of not less than one shilling per acre, subject to such terms and conditions as to residence or otherwise as the Governor in Council sees fit to impose; and every lease of any such lot shall contain a provision for the absolute forfeiture thereof, in case the lessee fails to comply with any such terms or conditions as aforesaid, or with the provisions of this act relating to such lot." But supposing the conditions of his lease to be complied with, the land is to be the lessee's own in fee-simple at the end of twenty years without any further payment.

A motion has been made in the Legislature requesting the Governor to place on the estimates for 1867 the sum of £10,000 to be spent on two exploratory expeditions to be sent to the west side of the island. But it seems preposterous to seek for cultivable land in the outskirts of the colony, when, on the admission of the Surveyor-General, there are two millions of acres fit for this purpose in the very heart of the settled districts in the midland and south-eastern counties. Although fit for immediate occupation, he does not, however, recommend it very strongly to stranger-settlers, because they would have for neighbours gentlemen who have grown nearly as rich as Crœsus on the adjoining lands. If there be two millions of acres of good land there, why not throw a large portion of it open at once to purchase at the uniform price of one pound an acre, without any further restriction than that of allowing no man to take up a larger block than eighty, one hundred and sixty, or three hundred and twenty acres? In order to protect the intending settler from being outbid at auction, they have in the neighbouring colonies been obliged to have recourse to measures of this nature. And why should not their example be followed? This vast extent of country is hired out to squatters for £23,000 per annum. A goodly quit-rent, truly—about 2½d. per acre for land which, if sold, would produce an average of one pound per acre! There is very little doubt but that this very land, if let on twenty-one year leases, would be most willingly hired by the present occupiers at that rate; a rental which might be continued in perpetuity.

It is suggested in the colony that these lands should be cut up into lots of one hundred acres each, and one lot granted to every adult above fourteen years of age, who had paid his own passage to the colony. Thus, husband, wife, and one child above fourteen years old, might obtain a farm of 300 acres in one block—no trifling inducement to many persons in Great Britain and Ireland, who could never hope to obtain so much property at home. Such immigrants to be bound down to reside for seven years on their grants, and to bring at least one-fourth of them into cultivation during that period; after which they would not be very easily induced to leave them.

"Stranger-settlers," such as the Surveyor-General would not recommend to have anything to do with land of a fair, if not of a superior quality, in the very heart of the settled districts, will be surprised to hear of the amazingly easy terms on which they can get land either on lease or in fee-simple, on the western side of the island. Any stranger-settlers may get a lease or leases for a term of ten years at a peppercorn rent of any of the unsettled lands on the western side of the island, in parcels of not more than ten thousand acres each, on condition of his agreeing to stock such land, within two years of the date of his lease, with sheep or cattle, in the proportion of fifty sheep or ten head of cattle for every thousand acres. The conditions could not well be made easier. So with regard to obtaining any portion of these lands in fee-simple. Any "stranger settler" may obtain a grant in fee-simple, of not less than fifty acres or more than one thousand, of any portion of these lands, in the event of his showing that he is possessed of capital equal in amount to one pound sterling for every acre applied for, on condition of his residing for a period of five years on some portion of the land, and spending a very moderate amount on it during that period in improvements. But land on the western side of the island would never have been sent a-begging after this fashion, if the Government had had it properly explored.

EMPLOYERS AND EMPLOYED.

BARNSTAPLE FARMERS' CLUB.

At the last meeting of this Club, the Rev. Prebendary BRERETON, President, delivered a lecture on the above subject, when he said: He who undertakes to lift a substance of great size and weight will be anxious to secure for himself at the outset two advantages, a good foot-hold and a good hand-hold. And he who attempts to form and express a comprehensive opinion respecting one of the gravest and vastest subjects of human inquiry will similarly wish to feel sure that he is himself in a position to stand under the weight of the subject he grapples with, and also that he perceives the points of the subject through which most easily the whole matter may be grasped. Certainly the subject of "Employers and Employed" is one, the discussion of which had better not be attempted at all except under favourable circumstances, for it will not be affected in the least by any superficial handling, and even when fairly lifted will, too probably, slip from the hold into its old position, before one step in advance has been taken. If the position from which I feel justified, at least in making the attempt, seems favourable, it is due to the confidence with which the members of the Barnstaple Farmers' Club have, for a second time, chosen a clergyman as their president. In doing so they have, perhaps, vindicated themselves from imputations to which the farmers are somewhat freely subjected, of being, as a body, indifferent to all wider and higher considerations than those of the barn and stable. They have also enabled me, should I be worthy of the task, to show that the highest aspirations, I will not say of social science, but of social religion, with regard to the welfare of the labourer, are not inconsistent with the feeling and practice of the most numerous class of employers in this country. This double position which I hold, as a clergyman and as President of a Farmers' Club, not only gives me a firm footing in approaching this subject, but also enables me to select two prominent points, by seizing which, I may, perhaps, hope to grasp the whole question involved. These two points shall be (1st) the Wages, and (2nd) the Homes of the employed. We commonly speak of the wages-earning class in this country as either "the labourers" or "the poor." It is too often lost sight of that these denominations do not belong to that class exclusively. There are working men and there are poor men in every class. The pressure of toil and poverty is often most keenly felt in families whose maintenance does not depend upon wages properly so called. I make this observation in order to disembarrass my subject at the outset of those false claims to special sympathy and compassion which are apt to be put forward in behalf of the labourers as a class, greatly I think to their injury and degradation. It is equally untrue to give them the sole credit of the honourable title of working men, and to claim for them, as a body, the sacred title of the poor. For this title, as it applies to all the sufferings and bereavements of life, includes our widowed Queen; and, as we all know by private experience, a large proportion, in all classes, of those who have lost in person or property what they had once possessed and loved. Inasmuch as the employed class are the most numerous, it may be the case that in it are to be found the greatest number both of those who do honestly work for their living, and also of those who are really poor. I only mean that it does not, by any means, exclusively consist either of one or the other. If, indeed, the so-called labouring class were composed for the most part of those who are, according to an expressive phrase, in reduced circumstances, who, having once had property, have been deprived of it by misfortune, and so are compelled to depend on the hire of their labour, they would then, in such a country as ours, be properly classed as the poor, as the objects of our compassion and charitable sympathy. But if the fact is that the majority of the labourers of this country are the sons and grandsons of labourers to whom labour for hire has been no degradation, but who have only not had the special qualities or opportunities by which many of their number have raised themselves into higher grades, then we ought to repudiate for them as a class this claim upon our exceptional sympathy, nor should it be represented as a grievance if they have only received their wages. I differ then from those who in the present day take up the labourers' cause, as that of injured men. I would rather congratulate our English labourers on the position they occupy, living in a country where labour is free, and capital, comparatively speaking, abundant. I do not, indeed, say that their condition may not be and ought not to be improved—far from it. But I think that their present position is one in which this improvement is not only attainable, but is actually taking place. And, believing that improvement makes most progress in those districts where there is a simultaneous amelioration of the whole state of society, and not distinctively of any one class, I rejoice to believe that on the whole a cheerful view may be taken of the condition and prospects of those who work for wages in this country. But it is said that the labourers of Devonshire do not receive a fair day's wage for a fair day's work. It may be replied that the farmers of Devonshire do not get a fair day's work for a fair day's wage. There is about the same amount of truth and of injustice in both statements. That the weekly rate of money wages in Devonshire is lower than the rate in other parts of England may be true; but that this money payment is supplemented (wisely or not) by other advantages is most certain. And it is not true to say that the labourer in Devonshire is a slave who has no choice or alternative as regards his employment and its remuneration. When we consider the facilities and inducements for removal and the extent to which the labourers for many years past have migrated, we may, I think, assume that the attraction which other countries and other parts of England may be able to offer to the labourers of Devonshire, has now for some years had its full effect; and that if the wages here are still comparatively low it is for two good reasons, neither of which imply any blame to the employer. The first reason is, that the supplementary allowances and privileges which have always been customary, are approved by the labourers so far as to keep the balance between the lower money payment here and the higher wages offered them elsewhere. The second reason is that in Devonshire all inferior quality and quantity of labour, as compared with other districts, is often all the labourer cares to give, all that the farmer gets, and all that he can be expected to pay for. It should always be remembered that there are two and only two ways by which wages can be raised without wrong to the employers or loss to the community. You must either shrink the number of labourers, or you must increase the amount of available capital. This is as certain as that there is no way of supplying the deficiency at a feast except by dismissing some of the guests, or procuring additional supplies. It is only a miracle that can make the existing supply, if too short, stretch to the wants of the whole number, or with a few loaves satisfy a multitude. If, therefore, the wages of a district are too low, and yet the population is not excessive, the only thing to be done is, if possible, to increase the capital, or wage-fund of the district. We cannot do this by miracle, but we are bound to see whether there are any natural means of effecting so desirable a result. Let us suppose that Devonshire were an island without any means of communication with other regions, and our state were that which I do now assume and believe it to be—one in which, by competition and open markets, a fair proportion of the annual produce reaches the labourer as wages, the landlord as rent, and the farmer as profit. If in this case it was felt desirable that the wages of the labourer should be increased, without robbing the farmer or the landlord, then it would be absolutely necessary to do two things: (1st), to pass a law to prevent the labourers from marrying; and (2ndly), to wait till, by the saving of the owners of capital, that capital should be increased; for unless some check were put upon the labourers' increase and some time given for the accumulation of capital, it would be simply impossible, out of the ordinary resources and annual produce of the land, to provide any increase of wages. But as Devonshire is no such solitary island, and as there is every facility by road, railway, and ships for the superfluous labourers to leave the county, there is no occasion to interfere with their disposition to marry. And for a similar reason it is not, I think, necessary to wait long for an accumulation of capital, for the same facilities that are to be found for an outflow of labour are to be found also for an influx of capital; only in both cases inducements as well as facilities are necessary to produce an effect: as the labourers must not only find it easy to leave, but must be tempted away by the prospect of better wages elsewhere, so it is necessary to tempt capital here by a prospect of good interest. And, therefore, the true question to be considered by those who are in earnest in wishing an improvement of wages, is this—Will the land of Devonshire yield a proportionate profit for an increased outlay? Happily this question is one that may be considered without any sore feeling, or bad blood, or question of wrong and robbery. But certainly on the answer to it, beyond all others, depends the prospect of legitimate improvement of the wages of the Devonshire labourer; and because that answer must be given practically by those who now occupy the land, therefore it is that I hold that the interests of the employed can only be promoted (except, indeed, by revolutionary violence) through the settled convictions and deliberate action of the employers. Whether there are sufficient reasons to persuade the present occupiers of the land that it would be remunerative to lay out more capital upon it, and to employ more labour, is a question well worthy of serious attention and discussion in this room. At present, I only wish to impress upon you that this is the only direction in which any considerable improvement of the labourers can be sought—that is, not by paying them more for their present work, but by being prepared to offer more money for more work and better work. Nay, even without assuming a greater expenditure in wages than at present, it may be believed that the state of the labourers, as well as of the general community, would be improved if a truer proportion was observed between the value of the work and the price paid for it. The householder in the Parable showed his right to do what he would with his own by giving to all the labourers the same wage; but, perhaps the Devonshire employers would sometimes best show their independence, and do most good with their money, if they used more discrimination in awarding it. A uniform and customary rate of wages is very apt to put the labour of the idle and the diligent falsely and mischievously on a level. Many a thirty shillings that is now paid in equal sums to three labourers for their hire would be more profitable to the employer, and much more beneficial ultimately to the employed, if one of the party found that he had truly earned and received 15s., and another only 5s. But the superintendence implied in such a just apportionment requires no little diligence, courage, and experience in the employer; and this again brings me to repeat that it is through the improvement of the employer that the employed will receive most real and lasting benefit. But here I shall be told by those who are throwing upon the farmers the blame of the low wages of the labourer that I am only confirming the grounds of their blame; and that when I say that improvement of the employer means improvement of the labourer, I, in fact, condemn the farmer by implication as much as they do by direct indictment. But it is not so. They, by their blame, impute a wrong done—an actual injury inflicted—by the farmer upon the labourer; and to this accusation I believe the farmer may plead "Not guilty;" and if the case be inquired into before the impartial tribunal of reason and justice, he will, undoubtedly, be acquitted, both from the nature and from the facts of the case. By the nature of the case, the farmer cannot give less than its value for an article for which the market is open; and, according to the facts of the case, it will appear that the labourer is content with his present wages, partly because he is conscious that his work is not of the hardest or of the highest value; partly because these wages, beyond their money-value, imply privileges and attachments which he is not prepared to surrender. Among other advantages, this is to be noticed. Owing to the numerous farms in Devonshire, and the very graduated rise from the small farms to the large, there is no bar, as in other districts, to an industrious, intelligent, and spirited labourer becoming a farmer; and certainly, if I were a labourer, I should estimate this chance of promotion as an equivalent for any defect in money remuneration. I would rather receive ten shillings where I and my children were not condemned to remain always in the bottom class of society, than twenty shillings where a social rise was impossible. But as another consequence from this state of things, not only may the labourer in Devonshire hope to rise and become a farmer, but he is, or may become, even as a labourer, socially connected with the farming class, and not unfrequently a sharer and inheritor of the farmer's capital. I am not sure that this close connection between the employed and employing classes is, in all respects, an advantage to the farmer, though I have no doubt that it ought to be considered a very important advantage to the labourer. The same ladder of smaller and larger farms by which the labourer may rise may be the means through which the farmer's family too readily descends. But this is not now the point. The fact is, that the agricultural labourer in Devonshire enjoys advantages and opportunities from this connection between the two classes which must always be taken into account in estimating the equivalents he receives for his labour. The same state of things modifies the opinion we should form about the allowance of food by which in many cases wages are supplemented. Where there is much fellow-feeling, and even family connection, these things assume a different aspect, and ought not to be compared to the infamous truck system by which some employers of labour drive a trade out of their labourers' earnings before they pay them. On these grounds, I believe, the Devonshire farmer may stand acquitted of the charge of wrong and injury done to the labourer. And my own doctrine, that the improvement of the labourer must be a consequence of a step in advance taken by the farmer, implies no more blame to the farmer for not having taken, or for hesitating to take that step, than the proprietors of the old stage-coaches were to be blamed for not anticipating the railways and so standing in the way of the vastly-improved position of the drivers, stokers, and porters of the present day over the ostlers and helpers of olden time. Any decided step in advance in the proportion of capital applied to our Devonshire acres, and the consequent increase of employment, must depend on many conditions. Among others I will mention two that seem to me most important. First, increased confidence in the security that the owner of the land may be able and willing to give to the occupier, that the capital which he, in the shape of labour and manures, mingles with the natural soil shall remain his own. This is a first condition of any increase in the proportion of capital to the acre, and the second condition is, I believe, the soundness of what is a new principle in agricultural economy; one which is only just presenting itself for consideration, and remains to be tested. I mean the principle that, owing to free trade and cheapened conveyance, the corn produce of other countries may be relied upon as an economical food, not only for our people, but for our cattle. If this should prove to be the remarkable and unexpected result of recent legislation and of improved communication, then I do seriously believe that we have before us a wonderful opening for the extension of our agricultural employment in England, and especially in this great cattle-producing county. The great barrier between agriculture and manufacture will then be broken down. If we do not bring back the labourers we have lost we need not part with any more, for we shall be able to employ all who remain and their offspring. And it is possible that the great towns of the north may yet be balanced by the thriving populous villages of the south. The opinions, then, which I venture to put before you concerning the labourers' wages are briefly these. No body of men could be better fitted than yourselves to endorse or refute them. 1. That the farmers have neither the wish nor the power to treat the labourers as slaves or to defraud them of their fair earnings. 2. That if the money earnings of Devonshire labourers are lower than those of other counties, they have compensating advantages that make an equivalent; due account being taken of the shorter hours and frequently inferior work which the Devonshire labourer, as compared with other districts, is accustomed to return for his pay. 3. That there are only two methods by which wages can be raised without robbery to the employer—decrease of labourers, or increase of capital. (The first, through migration and emigration, has been now for some time in operation, and has reduced the population enough to make the turn of the market more favourable to the employed than the employer. That this reduction of the rural population is considerable, may be shewn both by the census and by the unanimous evidence of all persons acquainted with the state of the labour-market.) 4. That the second method of improving wages, by increasing the capital that may be expended in additional labour, while it is the only method through which any real improvement can be effected, yet involves questions of risk and profit too serious to be hastily decided—questions which may be fairly started from philanthropic or other points of view, but which can only be practically decided by the experiments and observations of those who occupy the land. And as a corollary to these opinions I would lay down these axioms: 1. The true friend to the labourer is the improving farmer. 2. The greatest enemy to society is he who sows distrust between 'Employer and Employed.' And now let us shift our attention from the point of wages to that of the labourer's home. And here I know that the instinctive feeling of all present will be, if I may metaphorically express it, to take off their hats—to acknowledge that they are entering a region within which they have no right to intrude, and only ask to be admitted as friends. In his own house the lord of the cottage is as much to be respected as the lord of the castle; but I am much mistaken, and have lived in agricultural districts for many years under an extraordinary delusion, if the kindly visit of the employer is ever considered an intrusion by the employed; if even the 'squire or the clergyman are received with more cordiality in a cottager's home than the farmer. And let me ask, what interest has the farmer in the discomfort of the labourer? What pleasure can he have in seeing those homes untidy, unhealthy, indecent? Is not his interest, are not his wishes all the other way? For what do clean, wholesome, respectable houses indicate? They are the outward visible signs of inward virtue and happiness, of industry, of temperance, of honesty. And what farmer can be at once so wicked and so stupid as to desire to profit, or to think that in the long run he can profit by the laziness, and drunkenness, and dishonesty of those to whom he must entrust the execution of his plans, the cultivation of his fields, the tending of his stock? What right, however, have I to speak of any English homes as otherwise than clean, wholesome, and respectable? or of any English labourers as lazy, drunken, and dishonest? Alas! the right of too palpable facts, of too common experience. And in the face of these facts, and in the light of this experience, I cannot be content with expressing a conviction that it is not the wish of the employers that these things should be so; but I shall be, I believe, only carrying out the wishes of those employers if I raise the question. In what most practical manner can the employers, as a body, enable the employed, as a class, to rise above the degraded state into which too many of them have fallen? Permit me then, gentlemen, to suppose the case of one of yourselves with the friendliest feeling visiting the cottage of one of those you employ. Many things that perhaps would be noted at once as extremely shocking by a visitor inexperienced in real rural life would not strike your attention at all, or if pointed out to you would not seem to you any fit matter for compassion or blame. A low roof, a lime-ash floor, a rude staircase, a cob wall, you would know to be in certain situations the tokens, not only of a wholesome, but of a comfortable home; and even scantier sleeping-room than prevails in model houses would not seem to you so necessarily connected with indecency and immorality as many speakers and writers on the subject pronounce. For you would know that whatever might be the case with bodily health, yet decency and morality do not depend upon cubic feet or partition walls; but that virtuous families are never too poor to provide sufficient screens; while no building arrangement where virtue is absent will ensure purity. Your visit, therefore, to your labourer's cottage would not, I am well aware, produce in you at once the feelings of disgust and indignation which many express at the ordinary abode of the English labourer. If in your visit you found the inside of the cottage clean, the children healthy, the wife busy, and, perhaps, the grandfather or grandmother watching, one the pot, the other the infant, you would be very little disposed to pity the inmates or condemn the home. You would not notice or look for many of those defects which a sanitary inspector might find it his duty to investigate, and report to your Board of Guardians. But if, instead of cleanliness and health and industry, you were to find your labourer's house filthy, his children diseased, and other indications of wretchedness, I am confident that you would wish very much that this wretchedness could be lessened or removed, and you would be disposed to listen with attention to anyone who could at all point out any reasonable and hopeful means of amelioration. And there is one principle which the instincts of your own profession would peculiarly recommend to you, viz., that those social evils to which so many homes owe their wretchedness should, like injurious weeds, not be merely smothered and suppressed, but searched to their very roots, and by complete and persevering exposure destroyed. Now the very point which in a happy home is the last noticed becomes the most apparent in a wretched home—I mean the utter unfitness of the house itself and I must acknowledge I so far agree with the outcry of the day as to be convinced that in far too many instances the wretchedness of the inmates is to be traced to, or at least is inseparable from, the utter unfitness of the cottage to be a human abode. Where this is the case the employer, who would be his labourer's friend, may in many cases be so in a quiet and effective manner. An honest representation to the landlord of the true state of the case will not often be unattended to, when it comes from the occupier of the farm for the benefit of which the cottage was erected or is maintained. There can be little doubt that in many cases the landlord or his agent would have pleasure in responding to the appeal of the tenant; all the more if they felt that it was disinterestedly made for the sake of improving the labourer's condition, and not merely to throw upon the landlord some share of the employer's own obligation. There are other cases in which the cottage of the labour belonger to owners on whom the employer has no claim, and who, perhaps, will not listen to any considerations of fairness or generosity, who have either no motive or no means to make their property more habitable. But even in these cases the employer can with less invidiousness than almost any man bring the power of public authority to bear. It might be a very false step for a clergyman or a medical man to become an informant, or to meddle with individual cases when they are concerned with whole communities; but this objection would never apply to a farmer pressing the case of his own labourer's wrongs. But after giving the utmost allowance to the argument that a bad house makes a bad home, no man who has had much experience of the more favourable aspects of the English labourer's home will hesitate to look to other causes of mischief. For, improve the houses as we will, unless other things are improved, we shall still be far from our wishes. Is all as it should be as regards those public and other influences that ought to bear upon the labourer's own character; and so upon the comfort of his home? How about his education? his religion? how about his amusements and his friends? how about his shops and purchases? Is there not room in some of these things for the employer to be a friend to the employed—for the master to do good service to his servant? I will not in the last minutes of a lecture break ground to which it would be quite impossible to do justice, even in a course of lectures. I will only try in a very few sentences to indicate the direction in which I venture to believe that a kind interest taken by the employer would, more than any other conceivable influence, produce a practical improvement in the condition of the employed. As regards education, it is much to be wished that the employers generally would make it, more than they have done, their business to understand the present state of this great national subject. As it is, they are, it is to be feared, sadly ignorant of what has been done, and what is being done, and what is wished to be done, both by the Government and the religious denominations towards preparing the labourer for his future life. The subject has been looked at from all points of view, except, perhaps, that of the employer's; and much that is still undone, and much also that has been overdone, is likely to be practically supplied and corrected by their counsel and co-operation. If there is some hope at last of seeing established a thorough public system of English education, reaching to all classes, without disturbing the present framework of society, raising all but levelling none, this happy consummation will not be reached, unless the efforts of the higher class to elevate the lower, or of the lower to raise themselves, are at once seconded and controlled by the concurrence and practical guidance of the middle-class. If one can hardly conceive a more direct method of producing social discontent than to educate the labourer beyond the employer, so it is difficult to imagine a surer way to promote general happiness than that the better-educated employer should be in his turn the educator of the employed. Almost the same wishes might be expressed with regard to religion. For what is religion but at once the highest form of education, and its completion? And those employers cannot surely be accused of presumptuous interference, who, thinking that the condition of the labourer may be improved by the influence of religion, shall demand earnestly and impartially of the ministers of religion to see that the light entrusted to them shines out clearly and strongly to guide and comfort every class and person, but especially those who labour. The responsibility of the clergy of the established church is great in this matter. They are receivers of the most sacred of all public funds; and they are required to include in their ministry not only the like-minded, who may agree with them, but every inhabitant of their parish—of whose pleasure or displeasure they are, however, legally and purposely made independent. The employer therefore may always count upon two motives that should make the clergyman of his parish disposed to listen seriously and gratefully to any appeal that he may make, either generally or in a particular case, respecting the condition of the labourer. The first motive will be his sense of duty; the second his sense of independence. He, of all men, is bound to do his utmost; but while he may be reminded, informed, and advised, he cannot be dictated to. And whatever accusations may be brought against the clergy for neglect of their duty on the one hand, or for an over-assertion of independence on the other, I may, I believe, venture to say emphatically, in the name of the great majority of my reverend brethren, that we should only feel our hands strengthened and our hearts encouraged, if the employers in our parishes would more frequently bring to our notice their own views of what might be done by us in our proper sphere of duty to promote the highest interests of those they employ. And even in matters less than the highest the clergy will not be found reluctant to assist in any measure for providing innocent amusements or friendly gatherings, and in all kindly projects for making the daily life of the English labourer happier to himself, more creditable to his country, and more satisfactory to his employers. My subject hardly permits me to close without an allusion to those who think that it is a political rather than a social movement that is to make right all the wrongs and to remedy all the miseries of the English labourer. I can only ask, what benefit is likely to accrue to the lower class of society by any violent changes in our political constitution? and how can any change not be violent which aims at transferring in one convulsion a Government through the highest to a Government by the lowest, a leadership of masters and employers to a pre-eminence, or at least preponderence, of servants and employed? And yet, fear and excitement apart, who is there who does not oppose the wish that a real political change for the better might accompany and grow out of other changes in the labourer's condition? This does seem to be one way in which the change might be peacefully and fairly effected; though as it does not run in the grooves of any existing party, it may on that account be treated as an impracticable suggestion. But it is strictly within the compass of my present subject to inquire what would be the effect of extending to our unrepresented towns and villages the privileges of voting in convenient districts for the present borough members. Let the county representation be still for the most part in the hands of the higher and middle classes; but let the borough representation, at whatever limit of rate or rent it may be fixed, extend to the whole country. By such a measure the two dangers which many thoughtful Englishmen are dreading, will be greatly lessened: I mean the preponderance of overgrown towns, and in those towns of the wage-earning class. Every claim that can be set up for the artisan in the town must apply in fairness to as good a man in the village; and, as regards rates and rent, the sums paid in the village will betoken a decidedly superior grade of householder to the same sum which is paid in the town; so that whatever limit might be fixed to bring in the artisan class in the towns would bring in rather a superior section of the same class in the villages: especially those who having been journeymen had become masters, and passed out of the class of the employed into that of the employer. The carpenters, masons, smiths, tailors, shoemakers, and tradesmen of the villages and rural towns would become thus a makeweight against the massed artisans of the great towns; and at the same time from their closer connection with the agricultural labourers they would represent their wishes, till the time might come when, with safety to all, a less limited franchise might be introduced, and all house-holders exercise the privileges of citizens. Meanwhile, having reduced down to some reasonable and safe limit the borough franchise, and having extended it like the higher county franchise to the whole country, we might be allowed to pause before all political power should be concentrated in the urban population. Before the members for Totnes are transferred to Manchester or Leeds, we might be allowed to see the experiment tried of making them represent, not the miserable town which within its own boundaries has no interests of its own strong enough to balance the interest or resist the purse of any would-be M.P., but the great and important agricultural district of which Totnes is the natural centre. It has, perhaps, been a misfortune that agricultural interests have been so much confounded with landlord interests, and that it has been assumed that the county members adequately represent all the population not included in the represented boroughs. But as there are only 162 county members to 334 borough members, while the county population is 11,427,000, and that in the boroughs 9,300,000, there is a manifest injustice to the inhabitants who do not dwell within the present borough boundaries. And, looking only to the question before us, viz., what can be done politically to improve the condition of the employed class in the country? is it quite unreasonable to believe that to extend to them a proportionate share in the election of the 334 borough members would have a considerable effect in calling into more active life among them the wholesome feeling of citizenship without exposing them (as a false distribution does the present borough electors) to manifold temptations? It would be a very useful result of such an electoral change if it should gradually open the doors of Parliament to a class of men of whom one only, as by a miracle, now gets into Parliament. Not that it would be any gain if the more influential or aspiring of the tenant farmers were to take the place of the present county members; for we have not too many representatives of the higher order of the great agricultural body. And it is probable that the present member for East Norfolk may not be able to retain the position in which his brother-farmers have placed him, because the landlords in that county will have learnt the lesson intended by that election. But surely there are many men like Mr. Read in the farming class, who would be most useful members of Parliament, and true representatives of a lower and more popular franchise in agricultural districts. The same good sense which makes the farmers prefer to be represented by a landlord well-known and with a stake in their county, would make the better portion of the employed class prefer to be represented by an employer well-known and interested in their district. Or if any treat these views as Utopian, and believe that a labourer would be sure to choose a labourer, a farmer a farmer, and a landlord a landlord—each class its own special representative—I may fairly say there is a strong current of English feeling in another direction, a direction of trust, confidence, and respect, wherever superior worth in any person or class has made itself felt. And real English feeling has a tendency, after all, to shape and influence real life according to its better instincts, and I therefore am not ashamed to entertain the hope that the time may come when in Parliament itself employers of labour as good as Mr. Cobden, if not as eloquent or as violent as Mr. Bright, will faithfully and wisely advocate all measures that may promote peace and happiness, on the foundation of truth and justice, through every district of the land. And now I drop my subject, sincerely hoping that, though I may have wearied your attention, I shall have said nothing to increase the difficulties which at the present time especially attach to the duties you have to discharge as employers. I am well aware that I have very imperfectly done justice to the interest you take in that most important of all subjects, "the improvement of the employed." You will remember that at our inaugural dinner the Archdeacon of Barnstaple referred to a liberal donation of a bullock made by a highly-respected employer in this neighbourhood to the labourers of his parish. I notice in the *North Devon Journal* that that generous act of Mr. Crang had been most handsomely acknowledged by the labourers of Challacombe, who have requested Mr. Crang to keep a memorial of their gratitude and a token of the goodwill they feel for each other in the shape of a valuable inkstand. I commend this genuine, but not exceptional illustration of mutual good feeling between employers and employed to the consideration of those who are making or believing the monstrous statement that the farmers of Devonshire are black tyrants, and the labourers of Devonshire white slaves.

Mr. Andrew (Park Gate) moved, "That this meeting cordially approves of the sentiments contained in the excellent lecture the president has just delivered, and would particularly impress the importance of paying wages according to merit, and that more attention be given to the improvement of labourers' cottages." He highly approved of the principle of making a distinction in the remuneration of the skilled and unskilled labourer: the better class of men would thus get better wages, and the stigma thrown on agriculturists as a body that they did not sufficiently pay their labourers would be removed.

Mr. Yeo seconded the proposition.

Mr. James Moore said that one thing which would enable the agriculturists to pay higher wages would be the extension of leases by the landlords, so that the farmer might have a reasonable expectation of realising a return for the outlay of his capital.

Mr. Johnston asked whether he understood rightly that there was a deficiency of labour in the county?

Mr. John Langdon said there was a great outcry about the dilapidated state of the cottages in the country, but he believed they were worse in the town than in the country.

Mr. F. Maunder pointed out this difference which existed in the two cases. The labourer in the town had the opportunity if he did not like his cottage of getting a better one, whereas the labourer in the country working on a certain farm had no alternative but to live in the house which was provided for him; and, therefore, he thought the lecturer's suggestion that the employer should take an interest in the cottages of the labourer and use his efforts to procure from the landlord an improvement, was a most excellent and important one, and he was sure that it would be well received by the agriculturists of North Devon. The provision of better cottages would lead to the cultivation of better tastes, and there would be less inducement to frequent the public-house if there was a comfortable home provided for the labourer.

Mr. James Moore admitted the fact that the labourer ought to be paid a higher rate of wages, but asked how it was possible for the farmer to do this under present circumstances?

Mr. Maunder thought that the point mentioned just now by Mr. Moore as to the extension of leases was a most important one, and suggested that an independent lecture should be given bearing upon it, which should be followed by a very strong and decided resolution.

Mr. Johnston would like to be informed on two points, viz., whether there was any difficulty in obtaining the labour required by the agriculturists; and, secondly, whether, in the opinion of those gentlemen present, the wages they gave to their labourers was as much as they could afford? He had been hitherto acting on the assumption that there was a paucity of labour in the county—that emigration was denuding this part of the country of its labour, and pressing on the resources of the farmer; but if this were not the case all his remarks would be useless. If, however, such was the state of things how were they to prevent it? There were many means by which the position of the labourer might be materially improved, and a desire excited in him to benefit by all the advantages which he naturally possessed in this country, instead of removing to another part of the world; and if his assumption was correct, he should be glad to state how he proposed that emigration should be interfered with and prevented to a very considerable extent. And on this part of the subject he would say that he thought it was a very promising omen indeed that they found so many of the clergy of the Established Church connecting themselves with this Association, for it was principally through their influence, he believed, that the labouring man could be induced to rest more contented with the country than he was at present. The clergy in the darkest ages and in the most troublesome times had always bridged over the chasm that existed between the rich and the poor; and although circumstances had, within his own recollection, strongly altered, he had seen a great revolution in society taking place, which was diminishing very much indeed that broad line of distinction which formerly existed between the upper and lower classes. Still there would always be a necessity for some bond of union at those numerous points of contact where the same class met in future, and that bond of union must still, he believed, be the clergy, and that, too, of the Established Church. In several directions he had lately seen very great exertions made towards improving the mind of the labourer. It was seen in the endeavours to promote cottage garden exhibitions and rural enjoyments of every kind, and they almost always found them connected with the name of the clergyman of the parish. Now, he would tell what his experience on the labour question was in a colony where he resided for the greater portion of his life—what made the bulk of the emigrants, after a short experience, discontented with their new position and wish they had never left England; and that was the want of education for their children. They saw very plainly that by removing to a country which was on the borders of savage land their children would take a step nearer to barbarism; they felt certain that the next generation would come still closer, and they had the evidence before them of white colonists, who in the course of a century had sunk to the level of the savages around them. He thought that greater exertions should be made in the direction of education, and he was very glad to hear the President's observations upon it in his lecture. Another thing which made the colonists discontented with their position was the want of medical advice, and it led him to suppose that if the poorer inhabitants of this country could obtain greater facilities for attendance when they were sick, and if also there was a certain provision made for them when they became old, it would have very great weight with them in balancing whether they should quit the country or not. He had these thoughts presented to his mind from a perusal of one of the rules in the Government institution for insurances and annuities, which he thought might be worked with especial benefit to the working classes here, and which would most unquestionably bind them to the country—indeed they could not without great prejudice to their own interests go away. The rule was to the following effect:—"If any person under the control of the Commissioners of Inland Revenue or the Commissioners of Customs, or any person employed in any Government department, or any person employed by the directors of a railway company, or by a manufacturer, or other large employer of labour, after effecting an insurance on his life or contracting to purchase a deferred annuity or monthly allowance under these regulations, shall desire to have his premiums or instalments deducted from his salary or wages, and paid over to the officers of the Postmaster-General, and if the persons under whom or by whom he is employed shall be willing to undertake the deduction of such premiums or instalments from his salary or wages, with the view of paying them over to the officers of the Postmaster-General, then the Postmaster-General may, if he think fit, make arrangements with the said employers for such purpose, and may pay to such employers such remuneration for the work done by them or their officers or servants as shall be agreed upon between him and them. An arrangement of this kind will be very beneficial to the persons whose lives are insured or who are purchasing annuities, as, under it, they will run no risk of breaking their contracts by any failure of payment. If any employer of labour be desirous of entering into this arrangement for the accommodation and benefit of the persons in his employ, he may obtain information as to the nature of the arrangement by applying to the Secretary of the Post Office." Now, he considered that in connection with any national school this scheme might be worked quite as easily as a common club. An association of the employers might be formed in the parish, and leaving the ministrative functions in the hands of the clergyman who should adopt the principle contained in this rule, an interest might thus be aroused in every individual labourer, of such a character that they could not, without losing very great advantages indeed at a future time, leave the country. In connection with this he would attach the principle that, instead of the sick club held at public houses, they should be maintain-d simply and solely for the supply of medical attendance. That would, he was quite sure, satisfy the labourer as regarded two immediate wants in sickness. Sickness was the cause of three-fourths of the pauperism of the land; a system of this kind would, he believed, awaken greater interest in the poorer classes, and make them more contented with the locality in which they were born, than anything else which could be suggested. And, further, he would give to those gentlemen present who might be guardians another hint with reference to the treatment of the sick poor—that instead of entertaining the idea of sending them to the workhouse for the purpose of keeping down the rates as much as possible, the cottage-hospital system might be introduced in connection with this very object of the annuities and medical club, to be supported by subsidies from the Union. It had been tried in several of the large towns, and he thought that on a smaller scale the principle might be applied to every village.

Mr. **Wm. Thorne** remarked that if ever any public works had been started in this neighbourhood they had always found a large number of labourers seeking to be employed—a proof in itself that there was labour abundant in the country; and if labourers were not so abundant here, we should not hear of wages being lower than in any other part of the country. There was a want in the country, however, for skilled labour, and the observations made in the President's lecture were very pertinent and deserving the consideration of men of all classes who were in the habit of employing labour. He had been a large employer of labour in his day: and he had found in this neighbourhood men who were earning 10s. a-week better workers than those employed at 12s. a-week. Of course it was not to be expected that they would be scientific men. These men had been put on piece work. One of them earned 3s. 6d. a-day, and he would earn no more, his system being to go to work early in the morning, mark out his day's work, and after he had finished it he would leave. He used often to say to the man, "Why don't you go on at your work, and earn another shilling?" He used to say, "No, that's not my plan; I keep up my strength; I go and have my rumpsteak and pot of beer, and then I am fit for work. When they compared Devonshire with other counties it must be borne in mind that they had not the skilled labour of other counties; and it was natural that this should be the case, because they were not long enough employed in one class of work to become masters of it. It appeared to him that if any improvement was to be made in the condition of the agricultural labourer here it must be by some system to be adopted among the farmers of doing their labour by task-work, which would enable the skilled man to earn a larger amount of wages than he now did. It was quite true that the wages of the Devonshire labourer were complained of, but their lowness was not the fault of the farmer. The farmers in this district paid quite as much for what they got done as anybody else; but the labourers in other places were more skilled and had the opportunity of serving their master equally well and quite as cheaply, though they got a much higher rate of wages. If there was anything practical arising out of these remarks, it was that farmers should endeavour to devise some scheme by which labourers might devote themselves to one particular class of work, and by working for one farmer one week and for another the next, the men would get much better wages, and the work would be better done and more cheaply than before.

Mr. **J. B. Rock** said he recollected that about the year 1828 the very best labourers in this neighbourhood earned 10d. a-day, whilst provisions were quite as dear as now. A few years after that, they rose to 1s. 2d. a-day, and after the establishment of the Poor Law Board and the erection of union workhouses to 1s. 3d., 1s. 4d., and upwards. It was his opinion that the condition of the labourer, so far as wages and living went, was better now than it ever had been before. Years ago he had ground thousands of bushels of barley for human food, but they had not heard of such a thing for the last 15 years. The labourers now ate as good bread as the farmer or the squire of the parish—that was to say, if he was industrious and economical. Then there was another thing that had been done for the labourer during the last few years. They would find in almost every parish a charity-school where the children were taught sufficient to enable them, if they had anything like thrift or talent, to get on in life. There was another fact when they looked back to the time he spoke of, there were no railways to bring such exhibitions as the Bath and West of England and the Royal near to us, and the people in the west were isolated, and had not the enjoyments they had now. Now there were cottage-garden and other exhibitions, whereas then there were the village revels, where the men tore the flesh off each others' back like wild beasts, and fought like demons. That was a bad state of things, but it was very different now. The mechanic was better educated, better fed, quite as loyal and more so, and, he believed, contented, with but few exceptions. While they had been making progress in these things, there was one thing in which they had stuck fast—the labourers lived in the same cottages which had been erected hundreds of years ago. He maintained that it was the imperative duty of the landlord or the owner of the parish to see that this was no longer allowed to continue; and he thought that if the clergyman of the parish or the tenant made proper representations as to the actual condition of the cottages, the evil would be speedily remedied. In his opinion this was where they ought to begin, if they wished to improve the moral tone of agricultural labourers as a class. Every house ought to have at least three bedrooms—one for the father and mother, one for the daughters, and one for the sons; then some sort of self-respect would be engendered. Not only were the cottages in a bad state, but the farm-houses were worse. Some of them had stood for three or four centuries, and they were built in most unhealthy situations, where no provision whatever had been made for drainage. It behoved the landlords to provide more decent accommodation for their tenantry. There was another thought which had been suggested to him by a remark made by Dr. Johnston—viz., the advisability of providing cottage hospitals for the sick poor. He thought the best thing they could do was to provide healthy cottages and well drain them, so as to prevent the people getting ill. With reference to the wage question, the law of supply and demand would always rule the price of labour, and the most skilful, the most orderly, and the best-conducted men would always get the best wages over the profligate, the weak, and the dissipated.

The CHAIRMAN, whilst admitting the advantage of putting out work by task, pointed out some of the difficulties that presented themselves. There was the want by the farmers, for instance, of a system of comparison, in order to be able to satisfy themselves and the labourers that certain work was executed in a superior manner. There was also another point worthy of consideration—viz., whether early education could not be brought to bear on the excellency of future labour. In some parts of England the greater portion of the work was done by what were known as gangs of labourers; but the evil of this system was that the gang-masters were often persons who, although they knew their work, were not fit to have under their control a large number of young boys and girls. This system did not prevail in Devonshire, but he had always thought that it would gradually show itself, because it was economical and successful; and he was anxious to see if it was not possible for them to anticipate in Devonshire that system by endeavouring whilst the labourers' children were still at school to employ them in some useful way that would serve them as a sort of apprenticeship to their future work. He saw very great difficulties in the way, but to his judgment it did seem so very desirable that he had for some years persevered in keeping up a small labourers' school on the principle that the boy who came to it should go to work during half the day, as nearly as possible, fair reward being apportioned to him for the work done. He had found that those boys could pay a shilling a-week for their schooling, and get from a penny to threepence a-week besides for themselves. In his opinion that was one of the most important points connected with education—that we should well consider how far the preparation for the actual earning of wages might be connected with the preparation for fitting a man for a decent position in life.

After some further consideration, the discussion terminated.

The PRESIDENT announced that two agricultural works had been presented to the library by a member, and commended the example to the rest of the Club.

THE REPEAL OF THE MALT-TAX.

The Shropshire Chamber of Agriculture held its first meeting for discussion at the Lion Hotel, Shrewsbury, the subject being the Repeal of the Malt-tax. The attendance was very large, the agricultural element, of course, largely predominating. The chair was taken by Mr. R. O. Gore, one of the members for the northern division of the county; and there were also present Colonel the Hon. Percy Herbert and Mr. R. Jasper More, the members for the southern division.

The CHAIRMAN having explained that he had been very unexpectedly called on to preside, said his object in attending was not to make a speech, but to learn the wishes of his constituents on the subject which had called them together. He felt that it was his duty to do so, and to back up his constituents to the best of his ability, both in and out of Parliament. It was their wish that he should attend the meeting, and he considered it his duty to do so; and he could only say there was no one in the room who had the subject of the repeal of the malt-tax more deeply at heart than he had. He had always been strongly in favour of the repeal of the tax, believing it to be a most unjust and obnoxious tax. There were a great many arguments—better known to many present than to himself—adduced both for and against the tax; but as far as he could judge, the arguments against the tax very much preponderated over those in favour of it. He believed the malt-tax was now the only tax, or nearly the only one, levied on the raw material. There were some few other exceptions, such as chicory; but none of equal importance to the malt-tax. One of the great arguments against the repeal of the tax was the large amount of revenue derived from it; but if the levying of the tax were an injustice, then the greater the amount derived from it the greater the injustice inflicted; so that that was really an argument in favour of repeal. Several suggestions had been made to obviate the difficulty of doing away with so much revenue. The late Government—he wished to confine himself to the subject, and not to go further into party politics than he could help—thought it right to repeal the duty on paper, playing-cards, and French wines, which produced about the same sum as the malt-tax; but he (Mr. G.) thought those duties might have been well left on until the malt-tax had been repealed, for he believed that tax to be most unjust, and therefore the first which ought to have been repealed. He believed it had been proposed in some quarters that the duty should be taken off malt and put on beer; and he thought that would be better, because the duty would then fall on the consumer, whereas it now fell on the producer, and they would get rid of the anomaly of the raw material being taxed. That would be objected to by some of the large brewers, but not by all, for he might mention his friend Mr. Bass as being in favour of the alteration. The objection made to the duty being put on beer was that there would be difficulty in levying it, that it would be an inquisitorial act, and needlessly expensive, to ascertain how much beer was brewed in private places. If they considered the amount entirely lost to the revenue in the collection of the malt-tax, he thought they would say that was a strong argument in favour of the removal of the tax from the raw material. The malt-tax was about the only one which had not been reduced. In 1750 the duty was only 4s. per quarter, but in 1865 it had increased more than five-fold, viz., to 21s. 8d.; and the result, he contended, was a great injustice to the British farmer. When they took the duty off foreign wines he thought it a great injustice to the industrious and hard-working population of this country that the legislation should be in favour of the foreigner while their own claims were passed by. If they reduced the duty on malt, the poor man would be more likely to have his beer pure and nutritious than he now got it, because it would not pay the manufacturer to adulterate it if malt were cheaper. That would be a great thing for the working man, for he (Mr. G.) believed that a great deal of the disease and illness to which he was subject was occasioned by the bad quality of the beer which he drank. There was one thing he ought to mention: there was no hope of getting anything from the late Administration; but they ought to have some hope now, because in 1852 Mr. Disraeli, then Chancellor of the Exchequer, brought in a budget in which, though there was no surplus, he undertook to take off the malt-tax. That budget unfortuately was not passed into law; but having given that public expression of his opinion in the House of Commons, he did not see how Mr. Disraeli could now get out of it. If, therefore, there was a clamour now made, he thought something might be done in the removal of this obnoxious tax. What the other members of the Administration might think, now that they were in power, he could not tell; but he knew that some of them were very much opposed to the tax before they came into power. The hon. Member concluded by stating that he had briefly expressed his own views, that his heart was in the cause, and that he would help them to the best of his ability.

Mr. GOUGH (Gravel Hill), after explaining circumstances which had led to the absence of several friends who had assented to speak to the resolutions, said that however feeble and impotent he might be in the discharge of the duty he had undertaken, no one felt more strongly than he did the great injustice of the malt-tax. The question had been so canvassed that it would be but a mere repetition of what had been so often said to advance arguments against the tax; but he wished particularly to call their attention to the circumstances of the present being a most opportune moment to go for a repeal of the tax, because the present Chancellor of the Exchequer had almost lost his situation by proposing to defend the interest of agriculture on this particular point. He (Mr. Disraeli) had shown his earnestness by proposing a reduction of the tax to one-half; so that they had a right to calculate they should have his assistance. He certainly had not expected much from the late Chancellor of the Exchequer. His sympathies were so much with free trade, and he had allied himself so much with Mr. Bright—whose only desire seemed to be to stir up the passions of the people, and set class against class—that he did not think the hon. gentleman (Mr. Gladstone) would give his attention to the repeal of the malt-tax, or to any measure calculated to be beneficial to agriculture. Mr. Gladstone's attention, he believed, was more likely to be directed to measures which he (Mr. Gough) should be sorry to see carried in England—to franchises, and ideas about "the same flesh and blood," which if introduced into the House of Commons would be likely to result in other measures than the repeal of the malt-tax being carried. Mr. Gough here read the resolution he had to propose: "That the tax upon malt, being a tax upon the raw material, is opposed to the fundamental principles of political economy." Now what, he continued, was political economy? It was imagined by many that free trade was the great panacea for all the ills of this country; but it must be remembered that we had lived under protective duties for many years; and that England then went on progressing and growing, though not to so great an extent as at the present time. It was admitted that England was going on and becoming richer, and perhaps happier—but about that he did not know—and greater than ever it was under the old system. If then, he would ask, free trade, applied to other things, had led to this great advancement and progress, why should it not be also applied to agriculture? Could it be called free trade when the English farmer had to pay 2s. 9d. a bushel duty on malt to feed his cattle, while the Frenchman could import malt, feed his cattle and sheep with it, and then compete with the English farmer in the sale of beef and mutton fed on a highly-taxed article? If that was free trade, Heaven defend him from it. He should consider it a trade which taxed Englishmen, while the foreigners were let free. He was ready to admit that free trade was for the benefit of the country, but why hamper the farmer by it? The paper duty had been taken off. The paper manufacturers never asked for that to be done; but the gentleman to whom he had alluded thought it right to take it off because it was in accordance with free trade; and that being the principle which had been acted upon, he wanted to see free trade fully carried out by the repeal of the malt-tax. The maintenance of the tax was an injustice to the landed interest of this country—more so than to the tenants—for it was a tax upon every acre of land. Some said that the tax would only affect the barley growers; but he maintained that, in consequence of the tax, land adapted for the growth of barley was put under wheat cultivation. None but the best barley would pay for growing; and as the effect of the tax was to disarrange the ordinary four-course system by growing wheat on barley soil, and thus reducing the price of wheat as a consequence of the increased produce, he maintained that the tax affected the wheat-grower as much as the barley-grower. Having again alluded to the prospect of getting a repeal of the tax from Mr. Disraeli, Mr. Gough said he believed that Mr. Disraeli had the other day stated that if he saw he was sufficiently backed by the country he would risk his situation—and a very proud one it was to hold—on this question; but no one had a right to expect him to do that unless the country, and especially the agriculturists, wished him to do so. The position of Mr. Disraeli was a proud one, which he had been fighting for for years, and he would be a madman if he risked it for the sake of repealing the malt-tax unsupported by the country. There were parties combining together for bad purposes, and where they did so it was right that others should withstand them by combining for good purposes. There were parties who, let Lord Derby's Government do what it might—let it propose the best Reform Bill that could be framed—let it take off the malt-tax, or introduce any other liberal measure—would say: "We won't have liberal measures from you at any time; we will shut you up at once, and move a vote of want of confidence." Deprecating this course, Mr. Gough noticed the honourable conduct of Mr. James, a Liberal member, who said the other day, "Let us wait and see what measures the Derby Government propose, and if they are right we will support them," and concluded by submitting the resolution to the meeting.

Mr. Mansell (Adcott) seconded it, and it was carried unanimously.

The Chairman read a letter from Mr. R. G. Jebb, of The Lyth, near Ellesmere, expressing himself strongly in favour of a repeal of the malt-tax, and quoting the opinion of Sir Robert Peel that after the repeal of the corn-laws the malt-tax could not be continued.

Mr. Geo. Hilditch proposed the next resolution—"That the question of the repeal of the malt-tax has suffered from want of combination amongst agriculturists, and want of funds subscribed in order to bring the question properly before the country." The resolution embodied principles which he had advocated the last forty years. It had been said by the late Mr. Cobden, the great apostle of free-trade, that having abolished the tax upon corn, it was unjust to maintain it upon malt. Now, admitting this, why had not the tax been repealed before this time? It was from a want of combination among the farmers, and they alone were to blame. Every other body in the State looked after their own interests, and organized a defence when their interests were imperilled, and that policy was always successful. There was nothing new to be said by way of argument in favour of the repeal of the malt-tax: they were so well known, and had been so often used, that they had become stereotyped in the minds of men; but the important thing was to act upon what was known. He considered the question to be entirely in their hands, and that if they said they would have the malt-tax repealed, it would be repealed. It required no one to come from the dead to tell them that, because it was as plain as the sun at noon-day. The great question was—Would they act unanimously, would they recollect the distinction between singular and plural? Having spoken of the intelligence of the British farmer in his own avocations, Mr. Hilditch strongly recommended unity of action. If they did not take that course the malt-tax would not be repealed, because the Chancellor of the Exchequer, whoever he might happen to be, was glad to have a quiet sheep, like the agriculturist, ready to come and be shorn. He would not mention names, but he would remind the meeting that thirty-five years ago one of the county members for Salop lost the seat which the farmers had given him, by voting wrong on the malt question; and he would say, let every county member of England tremble for his seat if he did not vote for the repeal of the malt-tax.

Mr. P. W. Bowen, in seconding the resolution, predicted certain success if the farmers would act together; and he asked what greater insult could have been offered to the farmers of the kingdom than that which has been offered by Mr. John Stuart Mill, the grand philosopher, who said that because the coal-fields would be exhausted in a certain time the farmers ought to be made to pay the national debt. If such an observation as that was not enough to stir up agriculture, he did not know what would do so. There were many other things, too, which should make them think of the way in which they had been insulted by the Legislature in the last session. Mr. Bowen went on to argue in favour of combination, showing the effect of railways in bringing farmers into communion more frequently than formerly, and also pointing out the systematic course of combination pursued by the manufacturers in all matters affecting their interests.

Col. the Hon. Percy Herbert, M.P., was the next speaker. Suggesting that the meeting should endeavour to give some practical turn to its proceedings, the hon. member referred to the subject of petitioning Parliament. He pointed out that from the manner in which petitions were frequently got up, little attention was paid to them in Parliament; but at the same time they might depend upon it that petitions, signed by influential people really interested in the matter, would have weight with any Chancellor of the Exchequer or First Lord of the Treasury. That was one very obvious way of forwarding the question. An argument in favour of the repeal of the Malt Tax was that it would reduce the price of beer, and thereby also enable smaller capitalists to brew than did so now, and so diminish the practice of adulteration. Of course that would tend to diminish drunkenness, because a deal of drunkenness came from bad beer. It might also be urged upon the attention of the public and Parliament that a duty levied in the early stage of a manufacture is twice as pressing as one levied at a late stage. He was astonished last session to hear Mr. Gladstone and Mr. Milner Gibson compare the duty on malt with the duty on tea, the one article being taxed in the first stage and the other in the last, so that there could be no comparison between them. The present system was protective, and a great many of the maltsters were not anxious to have the duty taken off, because it kept a great many small men out of the market. Referring to a resolution which had been drawn, expressing the willingness of the Chamber to accept a tax upon beer as a means of supplying the deficit caused by the repeal of the Malt-Tax (but which resolution was not submitted to the meeting), Col. Herbert said he did not think it was any part of their business to suggest the means of meeting the deficit. He would also venture to say that he did not think they could reasonably expect any Chancellor of the Exchequer to create a deficit by taking off the Malt-Tax; but they would be perfectly right in urging the justice of repeal, and as there had been for some years a surplus of a million and a quarter or a million and a-half, if that surplus were applied to the deficit created by the repeal of the Malt-tax, within the next five years it might disappear. The imposition of new taxes to meet the deficit would be unpopular, but it might be submitted that as the manufacturing and commercial interests had for some years had the benefit of the surplus revenue by the remission of a great many duties, the surplus should now be applied to the benefit of the agricultural interest.

Mr. Walter Minor said he quite agreed with the hon. Colonel as to what they should do and what they should not do; but there was one point he must just allude to. He (Mr. Minor) was in the lobby of the House of Commons in the last session on the very night when this question was brought forward, and not one of the Members for the county was present except Mr. More. Now, if the Members would attend in their place and do their duty on the question—[the remainder of the sentence was lost in a tumult of applause]. He had not (he continued) made this observation with the view of giving any offence, but he did not consider that, when gentlemen were placed in the position that the Members for the county were in, and more particularly when they had pledged themselves on a certain question, they ought either to perform that duty or else do what the hon. Member for North Shropshire had done, resign their positions.

The Chairman said he was ill in bed at the time and could not move, otherwise he should have been in his place in Parliament, and he believed he had written to that effect to the newspapers.

Col. Herbert said that Mr. Minor should have made himself acquainted with the facts before bringing such an accusation against him, as he (Col. Herbert) was present in the House on the occasion and did vote.

Mr. Minor said he was not aware of it.

Col. Herbert replied that if Mr. Minor had taken the trouble to look he might have correctly informed himself, and then he could not have made such an accusation. Had he (Col. Herbert) been absent from the meeting the accusation might have been taken as true. It was perfectly scandalous that Mr. Minor should make an accusation of that kind.

Mr. Minor said he was sorry he had made it. He knew Mr. More was present.

Col. Herbert: And you might have found out who else was there.

Mr. Hilditch and Mr. Gough spoke in approval of Col. Herbert's view that it was not the business of the advocates of a repeal of the malt tax to propose a substitute to the Chancellor of the Exchequer: the latter also pointed out—as an instance that Shropshire members had done their duty on the question—that some time ago 10 out of the 12 members had voted for the repeal of the tax.

Mr. J. Bowen Jones argued that the tax ought to be entirely removed; but, if the alternative were put that the malt tax must remain or a beer tax be substituted for it, he considered they would do well to accept the tax in its last stage, the present tax being upon the raw material, instead of the manufactured article. A tax upon beer would be relieving the farmer and also the consumer, the brewers' profit being upon the tax as well as the raw material, and the cost of conversion. He, however, considered, with previous speakers, that it was not their duty to suggest any substitute, as they were not amateur Chancellors of the Exchequer.

Mr. Jasper More, M.P., said he was glad that Mr. Gough had given the Shropshire members due credit for their support of this question. The chamber had discussed the repeal of the malt tax before any other question, from the interest the county took in it, and to show Mr. Disraeli, as he had said his dealing with the question depended on the support it received in the country, that Shropshire was as willing as ever to support it. If all other agricultural counties did their duty to the question as Shropshire had done, and if the repeal was a question of support in the country, the tax would soon go. He agreed with many county memers who said it was rather their duty to listen to the views of their constituents on occasions like the present than to speak; but he thought that on a subject in which many constituents were interested the voices of their representatives with them would not be discordant. The repeal of the malt tax required study for those who had no practical knowledge of the subject, and there were no public books of reference in Shrewsbury. He hoped by degrees, however, they might form a small and select library for their own use. They might, however, state facts and figures which they knew from experience, without caring for fine language or eloquence to express them with. There were various objections made to the repeal in the House of Commons, which they, from their practical experience, ought to instruct their representatives how to answer. The first was that the repeal would not benefit agriculture so much as they thought. 2nd. That malt would not be extensively used for feeding purposes if the tax were repealed. 3rd. That working men could or would not brew at home, and therefore the repeal would not keep them from the public-house. Again, it had been said that this was a consumer's question, and not one for the producer, and that therefore it did not so much concern the farmer. Those four questions he should like them to answer. Now with regard to the impolicy of taxing the raw material, the teaching of Sir R. Peel had been thus summarised in the House of Commons: "If you tax a raw material, which has to pass through different stages before it becomes a manufactured article, the tax before it reaches the consumer is doubled, rebled, or quadrupled. The consumer pays two or three times the amount of the original tax, whilst two-thirds or three-fourths are lost to the country; and although he has to bear the burden of the whole amount, scarcely one-third or one-fifth goes into the Exchequer." In the case of barley, 1st there is the tax on malt; 2nd, on maltster's licences; 3rd, on brewers' licences; 4th, on publicans' licences; 5th, the salary of the excise-officers; all of which, besides the publicans' profits, the consumer has to pay for. The question with regard to beer as a substitute, is whether a tax on beer could possibly make the consumers pay as much as these put together. With regard to what had been said of the commercial classes not standing such a tax on their commerce, Mr. M'Culloch, the best authority on political economy and taxation, gives an instance in connection with the malt-tax. He speaks of the duty of 3½d. a yard on printed calicoes, which amounted to £600,000, and was repealed in 1831. He allows that, like the malt-duty, it appeared to fall chiefly upon the consumer, but it fell powerfully on the producer by narrowing trade. He says the depression of the malt-tax on agriculture is analogous, and the statements made respecting calicoes might be made, *mutatis mutandis*, with respect to the pressure of the malt-tax on agriculture. With respect to the question of funds for promoting the repeal, the Anti-Malt-tax Association only received £800 last year, and he regretted to see no Shropshire name but Mr. Pryce Bowen's on the list of subscribers. All classes having condemned the tax on principle, it was said to be only defensible by reason of the amount of revenue it produces. This led to the question of whether repealers should suggest a substitute or not. To this he would remark that whenever a repeal had been attempted a substitute had been suggested. In 1834, when the House of Commons carried the repeal—and here he would just observe, as a remarkable fact, that the agriculturists were never so strong as just after the passing of the Reform Bill—Sir R. Peel at once proposed a substitute, which was a property-tax, the very thought of which made the country gentlemen come down to the house and rescind the vote. When Mr. Disraeli, in 1852, proposed the reduction by one-half, he also proposed a substitute, a house-tax, and found himself in a minority on his budget. And here, he would say, it did not follow that he was in a minority because he proposed a reduction of the tax, but because he proposed a house-tax as a substitute. Mr. Cobden, when he was written to on the subject, at once proposed a substitute. Viewing the matter from a liberal point of view, he proposed that the agriculturists should aid him in effecting a reduction of public expenditure to prevent any deficit being made. Whether there was the least chance under the present Government of a reduction of the two chief items of expenditure, the army and navy, his hon. and gallant colleague might might be better able to judge than any of them. He only feared that such would not be the case. With respect to a tax on beer, it had this merit, that the money could be raised by a tax of only 1d. per gallon, which would nearly produce the sum. It was a fact with which all must have been struck who had travelled much in Europe, that in the countries where the tax is upon beer, in those beer is cheapest. Of course, Bavaria, which had the greatest reputation for beer, had so small a revenue to make up, that the fact might not be worth much as an argument; but it was a fact that in Bavaria and Prussia, where the tax was imposed on beer, it was cheaper than in any other parts of Europe. In his opinion the greatest sinners in the world were the brewers, on whose heads the tax ought to fall. Sir Morton Peto, the best writer as an opponent of the repeal, said this of them in his work on taxation, "The brewers have a monopoly, not only of the supply, but the sale of beer. By aid of the investment of a vast amount of capital in public-houses, and by means of the licensing system, the brewers have been able to keep the value of beer in their own hands. They have raised the price of beer to the highest figure the public can bear, without affording the public the slightest share of any one of the advantages which they themselves have derived from a repeal of the corn-laws, the remission of the hop duties, or the relaxation of the restrictions which were formerly applied to the various branches of their business. If an increase of this tax would not be injurious to agriculture or trade, if it fell alone on the present inordinate profits of the brewers, there are few if any of us who would not think that the tax might be raised." He could only say that if the counties were now to show such an unanimity of earnestness in this question as would make all their representatives earnest in the House of Commons, such a pressure would be put on any Government, whether Liberal or Conservative, as would oblige them to repeal the tax.

Mr. JOHN MEIRE spoke in terms of regret of the absence from the meeting of the landed interest of the county, without desiring to particularise or cast censure upon any one. Contending that the landlords were interested in this question, he hoped they would be stimulated to do their duty; and as to the Government, he trusted it would act upon enlightened principles, so that the springs of industry might be relieved, and that there should no longer be a tax falling heavily on the producer to the amount of six or seven millions. If the Government did justice to the British farmer, it might have a long run of office; but if it neglected the opportunity, it would commit suicide as a political party and be the laughing-stock of the country. He trusted that, at any future meeting of farmers, he should see as many determined to seek their rights as he saw present that day, and he was sorry there had hitherto been so much apathy exhibited amongst them and the other classes upon this subject.

Mr. JOHN BATHER addressed the meeting at considerable length. In a complicated system of taxation, he said they might disagree as to whether it should be direct or indirect taxation, for they were happily not come to the simplicity of a revenue levied by one tax, and that an income-tax made by those who did not pay it, but how soon it might come to that they knew not. They had not only to consider the repeal of the tax, but also the consequences of the repeal. He was not afraid to take that course of argument among the company of enlightened men he had met there that day. He thought they ought to take the tax as producing six or seven millions. It was not the only tax that would have to be repealed; but, as Mr. Gladstone, one of the cleverest Chancellors of the Exchequer we had ever had, had said that if the malt-tax were repealed there was no escape from a repeal of the tax upon spirits, that it would not be satisfactory to the country if the drink of England were untaxed while the drink of Scotland and Ireland were taxed. The repeal of the malt-tax, therefore, involved the repeal of the duty on whisky. He did not know how much that amounted to, but perhaps three times the amount of the malt-tax. It had been argued that it was the business of the Chancellor of the Exchequer—for which he was paid—to find a substitute for the malt-tax; but he (Mr. B.) maintained that they could not consider the question of repealing the tax without looking at the consequences, as it was one of the largest sources of revenue from indirect taxation. And what would the consequences be of repealing this large item of indirect taxation? Ten or twelve years ago there was a partial repeal of the tax upon malt for exportation. That cost the revenue but a small sum, and no doubt it was a wise measure, as it developed a large trade; but how was the Chancellor repaid for the loss? Why, by inflicting upon the landed property of this country the heaviest blow it had ever, in his opinion, received in the memory of living man, viz., the imposition of the succession duty. Mr. Meire had just said that the owners of landed property did not go with them; the truth was they had not their hearts in it; they did not want a repeal of the tax; they knew what would follow. If they were present they would not hesitate to speak their sentiments any more than farmers. Was it not strange that this tax had not been repealed if it was really so burdensome? They were only prolonging the question if they did not speak out their minds. If this tax were repealed, landed proprietors were afraid that there would be substituted direct taxation. If they attempted to substitute a beer tax, as was suggested, the proposal in the House of Commons would not have the least possible chance of being carried, as the interests of a large number of the members would be opposed to it. That was one of the reasons why the owners of property did not care about the repeal of the malt-tax. The repeal of the tax would not benefit farmers so much as they imagined; they supposed they paid the greater part of the tax, but that was a mistake. He (Mr. Bather) believed that the greater part of it was paid in the manufacturing districts, where there was more beer drunk, and of better quality. There was more beer drunk at a single beer-selling place in London or Manchester in one week than in half of Shropshire, in the agricultural districts, in twelve months. Now, what was the price of barley? It was nearly 8s. at the present time (No, no), and wheat was 9s. 4d. or 9s. 6d. He maintained that if barley was at 8s., the price proportionately of wheat should be 12s. It was the malt-tax that kept up the price of the best barley. It would be short-sighted policy if they fought for the repeal of the malt-tax with the view of increasing the interests of barley growers. As to using malt for feeding cattle it was the greatest mistake in the world (No, no). Well, gentlemen might have their own opinion. As to a tax upon beer, something of the kind had been introduced several sessions ago, when it was proposed that not only public brewers and those who sold beer, but also householders should take out a beer licence of about £2; that was found so hateful that that part of the Bill was immediately abandoned. And if a tax were put upon beer, what boon would that be to the poor man? The result would be that they (the better classes) would go free and the poor man taxed. He could not see how this was defending the interests of the poor man. If there were a pressure of work, instead of giving the agricultural labourer beer they had better give him more wages; it was the principle adopted in trades and manufactures, and the sooner it was applied to agriculture the better. He hoped and believed there were many there who delighted in the name of Conservative; but he hoped they would not measure their Conservatism by malt, for it was not a fair test. They were something more than growers of malt, and he did not think Conservative opinions should be sacrificed to the malt-tax or any such subject, and he could not but regret if there were any there calling themselves Conservatives who were induced to swerve from their principles by any such considerations.

Mr. Gough, Mr. Hilditch, Mr. John Meire, Mr. Henry Smith, and Mr. Pryce Bowen severally replied to Mr. Bather. It was argued that malt is an excellent feeding stuff for cattle and sheep, and would be extensively used if the tax were repealed; that the price of barley is attributable to the small quantity grown—that, in fact, it would soon almost cease to be cultivated if the tax on malt were continued; that the relief afforded by the abolition of the 2s. 10d. duty would give a large sum to be expended in comforts and necessaries, and thereby tend to relieve the taxation of the country; and that if there was any connection between the duty on malt and the duty on whisky, taking the converse of the proposition which had been put by Mr. Bather, Mr. Gladstone should have repealed the malt-duty when he took a large part off the duty on spirits. A hope was also expressed (by Mr. Meire) that Mr. Bather had libelled the county gentlemen.

Mr. MORE said they all felt much indebted to Mr. Bather for giving them the other side of the question. There was one statement of his which ought not to go forth to the world without comment; and he wished to ask him whether he felt sure that the succession duty was imposed on property in consequence of so small a boon to agriculture as the exception from duty of malt for exportation and distillation? That duty was taken off on August 14th, 1855, when the quantity of malt exported was less than 200,000 bushels. The repeal of the duty made the amount of malt exported rise in a year to a little less than a million bushels; but, taking malt for exportation and distillation together, the amount duty-free to the amount annually malted for home-brewing was only in the proportion of about one-eleventh, or 4,600,000 bushels to 49,000,000. Was this small boon considered an equivalent for a succession-duty on property? With respect to a duty on beer, he wished merely to observe that some persons spoke of it as if it was proposed to add a tax to what the consumer had already to pay: of course, that was not the proposition. The question was, whether a duty on beer alone would not lower the price of beer more than by taxing the raw material through five successive stages before they drank the beer.

Mr. Bather explained that he did not mean to say that the succession-duty was imposed in consequence of the partial removal of the malt-duty, but it was included in the same budget.

THE BIRMINGHAM AND MIDLAND COUNTIES SHOW.

The visitor to Bingley Hall would have found the study of his catalogue a somewhat vexatious business. As with certain famous views and scenery, he would read of beauties in his guide-book that he will seek in vain to discover. He would gather, for instance, that Mr. Heath from Norfolk has entries of Shorthorns and Herefords, that Mr. McCombie has still a place with his Polled Scots, the Duke of Sutherland with his Highlanders, and Mr. Stewart, of Aberdeen, with his capital crosses. The Royal Farms, again, appear to be so well represented by Devons and white-faces that one might have been almost led to anticipate the countenance of Her Majesty on her way home from Wolverhampton; while Mr. Rowland Wood has prepared another steer, Mr. Stratton fed off a cow, and many other successful exhibitors like Lord Aylesford, Lord Howe, Mr. Sheldon of Brailes, Mr. Ladds, Mr. Manning, Mr. Samuel Wiley, Mr. Lynn of Stroxton, Lord Radnor, and Mr. Swinnerton are as ready as ever to uphold the superlative merits of the Shorthorns. Nor is the Hereford without his especial champions, when such men as Turner of The Leen, Thomas of Monaughty, Walker of Westfield, Shirley of Baucott, Pike of Mitton, and Lord Hatherton are amongst the exhibitors; as Farthing of Stowey, Frampton of Blandford, Smith of Exeter, and Hambro of Milton Abbey, promise as well for the Devons. Even the old Longhorns are not without their supporters, and a sample or so is spoken to of the Welsh runts and Kerry cows. But, alas! these are mere words, for the centre of the Hall is sparsely stocked with Shropshire sheep; one side is flanked with fighting cocks, and Messrs. Jones of Sprinfield, Keary of Bridgnorth, and Sanday of Holme Pierrepont, have their instructions countermanded, for so far as their duties be concerned it is a maiden Assize.

It would be idle to argue here on the policy of permitting a cattle-show to come off in 'sixty-five and forbidding this in 'sixty-six, the more particularly under the conditions that the beasts be sold and slaughtered where exhibited. At Birmingham such an Order was, of course, considered unnecessarily severe; but the Council did the best they could under the circumstances, and manfully opened their doors to a display of sheep and pigs, poultry and pigeons, roots and seeds. As the public were, as heretofore, warned off this section of the show during the time the awards were being made, we can say little more from our visit on the Saturday than that the cocks and hens appeared to be more comfortably accommodated than ever in their new pens, as, with the additional space at command, their admirers will have their share of enjoyment from so convenient an arrangement, and this department should accordingly become the chief feature of the meeting. There is the more reason for assuming so much, as beyond the absence of the cattle the roots were poor, the sheep barely up to an average of excellence, and the pigs, with the exception of the Berkshires, wofully inferior. So bad, indeed, was the opening class of three fat pigs, that the judges withheld two out of the three premiums, only awarding the first to Mr. Melville Cartwright for some good-coated whites of ordinary merit and nothing more, which won against some narrow, plain, ill-conditioned things of Mr. Walker's, and some yet more miserable little animals exhibited by Dr. Fletcher. In the older class, again, the two Royal Windsor pens had it all to themselves, uniting good hair and level feeding with fine quality, and the best here was, of course, the Cup lot, or best entry of three fat pigs. Mr. Ashton's third prize pen, though on a larger scale, were terribly short of covering, and Mr. Stearn is by no manner of means so strong with a white pig as a black one. This fact was demonstrated in the next class of single fat pigs, where the Suffolk achieved an easy triumph, being a really admirable pig, with a fine long coat and a famous head and neck. So broad is he across the shoulders that he seems to "dip" a trifle from this very cause, but he is otherwise very true; and Lord Radnor's neat little white had no chance for first. Mr. Duckering had also two pretty pigs in here, and one wretched coarse slack-framed old brute which had better have been killed off at home. The Northope and Carhead cross, however, as demonstrated by the Messrs. Howard, would promise to "nick," although their highly-commended entry, an otherwise lengthy and good one, was very short of hair—a point that must manifestly be corrected in a prize pig. Mr. Mangles sent an animal far below his previous standard; but this class, on the whole, was more creditably filled than any but the breeding Berkshires. Of these, Mr. Smith, of Henley-in-Arden, had, as usual, the best, the Cup pen being long, straight, highly-bred animals, of fine quality, though with no lack of that useful character which *should* be such an essential point in maintaining the Berkshire breed. Mr. Dixon's second-best pen, although very young, had as unmistakably the true mark upon them; but the third prize lot, otherwise very excellent, appeared if anything a little too finely bred for the purpose. The strength of this class may be estimated by the additional honours bestowed at their discretion by the judges on the entries of Mr. King Tombs and Mr. Yells, while Mr. Bailey of Swindon received no notice whatever. It is rather remarkable that well as these Wiltshire-Berkshires still stand with pig-fanciers, their success in the show-yard is only occasional. The other class of large breeds was wretchedly bad, and Mr. Bantock, a new exhibitor, may thank his company for getting so forward as he did with a very moderate entry. In fact Mr. Wainman's second-prize pen included one of the very worst-framed young pigs ever seen, and the judges declared there was only one really good lot in the class. These were the five entered by Messrs. Howard of Bedford as of one litter, whereas the veterinary inspector distinctly pronounced them *not* to be of one litter; and a placard, proclaiming the disqualification of the pen, was at once put up—much, we must say, to the astonishment of the pig-man, who was ready to swear, there and then, that they were five out of a litter of eleven, and as such, we believe, shown to us a few weeks since on our visit to the Hoo Farm. One is, in truth, loth to believe that gentlemen of the position of the Messrs. Howard would descend to such trickery as they are here found guilty of; and it must become a very serious question, if the Birmingham pig show is to be continued, how far this system of veterinary examination can be trusted? Mr. Allender's case of only last year proved the utter fallacy of the theory, though no reparation was ever offered; but it is monstrous to imagine that men of character will lay themselves open to the effects of such a haphazard business as this matter of inspection is evidently becoming. In the small-breeding classes, Mr. Stearn matched five more of his beautiful short-snouted symmetrical blacks; with a lot of curly-coated white Windsors for second, and two or three good pigs only out of the Givendale entry for third. As Lord Wenlock and Mr. Wiley did not show up, the competition extended no further, and Messrs. Spearing and Moon brought an easy day's work to an early conclusion.

Amongst the sheep there was not only numerically more to do, but the distinctions in certain cases were far more difficult to draw, and one or two of the awards are pretty sure to be discussed with some warmth by the public. Not that amongst the long-wools there would be anything to complain of, as the point of preference with the Leicesters was confined entirely to Mr. Foljambe's two entries, both handling admirably, and both showing most of the fine points of the breed; but the first-prize trio had more style, and were better matched than their companions, if for a single sheep, we should have gone to the other pen. Mr. Walmsley's thirds were also of good character, but too soft in their touch, as Mr. Bradshaw's were high-bred enough to deserve their commendation, but there was not much to admire in Mr. Herrick's coarse and "just" useful sheep. The Cup, however, for the best pen of Longwools went—for the first time, if we remember aright—away from the Leicesters to the Cotswolds, and certainly Mr. Wigmore's prize pen for uniformity, symmetry, and quality are very admirable. As they faced you, we have seldom seen the same type more truly preserved, and on this point alone they gave Messrs. West a thorough beating, as the second-prize pen was by no means so sorty, with one really grand sheep, pulled down by two of more moderate pretensions. The character of the Bickerton flock was well maintained in the third prize, and to "go on with" it is very necessary to keep such a family resemblance in the mind's eye. With Mr. Fookes, pretty generally acknowledged to be one of our best authorities over Southdown in office, the judges were still thought to have got all wrong in their shearling class, the sheep, in fact, that Mr. Fookes would have placed first his fellows placed last; whereas, had the other two judges who have heretofore acted over sheep and pigs been called in, the majority would have been the other way. There were in all four entries—two by Lord Walsingham, one by Lord Sondes, and one by Lord Radnor, with the first prize going to Coleshill, the second to Elham, and the third, with a high commendation, to Merton. For weight, backs, and mutton, the commended sheep were unquestionably the best, but they lacked the refined appearance or breeding of Lord Radnor's, and between the two it might have been a very close thing. Lord Walsingham's other pen, though pronounced to be the better of the two, was made-up of very plain sheep; and one of Lord Sondes' three was so indifferent as to quite put them out of it. But the two Shropshire judges hung together, instead of deferring, as they might very gracefully have done, considering this was his own particular province, to a better man on the merits of a Southdown than they could either or both ever aspire to become. The question was at once raised as to whether it is proper to select two out of the three judges from the supporters of the same sort of sheep? In answer we should say it would be far better to take one Southdown man, one Shropshire, and one Leicester, Lincoln, or Cotswold breeder. In the older class of Downs, Lord Sondes had no entry, and the competition, with a couple of odd lots out of it, was entirely between Lords Walsingham and Radnor. In distinguishing between the two pens from Norfolk, weight had the call over style; but we should have placed them the other way, as we are told Day, the shepherd, is of our way of thinking. Still, the three prize pens are all good, and there will be little of that cavilling over their places that has already followed in the shearling award. Some of their supporters, and your Salopian on this subject is a very Boanerges, declared it to be the best show of Shropshires ever seen in Bingley Hall; but with a few really admirable sheep we cannot back the record. The lack of uniformity, or variety of character was as striking as ever; the trimming and touching and colouring in many cases simply infamous, and it is only to be regretted that some plan of disqualification had not been carried out. If a prize pen of pigs be condemned because one gets a little too forward in his month, what should be done with a show pen of sheep where every possible piece of roguery is resorted to? One man cut his sheep's backs after the model of his mahogany, another had in places never touched them with the scissors, and a third burned out their heads and ears to the orthodox shade and shape. But Mr. Smith, of Sutton Maddock, never got his sheep so much of a muchness, and their success was a foregone conclusion, as indeed was that of Mr. Nock, with three of the handsomest Shropshires ever brought together. They were not only well grown and well sorted, but capital handlers; and so they took not merely the first prize of their class, but the additional cup, as the best pen of three sheep in the yard. But perhaps this is not to be wondered at, considering how the Bench was constituted. Mr. Anderson May's second-best were also very good useful sheep, of nice character; and in the pens of five Lord Wenlock showed two lots, one from his Bourton and the other from his Escrick flock. The Yorkshiremen were the more fancied of the two at home, but the others had more of the Shropshire in their appearance, and the high commendation went accordingly. Amongst the old sheep there was no competition, and in the single wethers, where Mr. Beach was also first, he was run very close by Mr. Smith with a grander sheep, but not quite so good in the touch. The solitary class of Oxfordshire Downs received the especial honour of a general commendation, the only compliment of the kind in the day's proceedings, and, even further, they deserved it. There was not an indifferent pen—we had almost said not an indifferent sheep—amongst them; while they seem to be working up more and more to a recognised standard. The Blenheims were indisputably first; but we question whether for completeness as a lot Mr. Druce's highly-commended wethers were not superior to Mr. Stilgoe's placed above them. Mr. Overman's cross was not so happy as usual; and beyond Mr. Bradshaw, none but outsiders went in for Leicester ewes, though Mr. Findall's first is a pretty compact well-bred one; and Mr, Casswell's capital Lincolns running to seven entries out of ten, quite out-voted the Cotswolds. In the mixed Down class it was a match between the Southdowns and Oxfords—Lords Sondes and Walsingham with Mr. Foljambe appearing for the former, and the Duke of Marlborough and Messrs. Wallis, Fowler, and Stilgoe on behalf of the others; but the Oxfords have as yet scarcely family tracings sufficient to court the comparison.

Want of room must always tell against any implement display in Bingley Hall, although most of our leading firms were represented here; but it would be idle to do more than give the names of the chief exhibitors, as there was little or nothing new, and every man will be known by his works. Still, the number of exhibitors struck us as being greater than usual, while amongst these were Messrs. Clayton and Shuttleworth, the Howards of Bedford, the Hornsbys of Grantham, Garrett of Leiston, Ransome and Sims, Richmond and Chandler, Bentall, the Turners of Ipswich, Humphreys of Worcester, Amies and Barford, Wood of Thames-street, Ball and Son of Rothwell, Boby from Bury, Marshall of Lincoln, Bamlett of Thirsk, Hill and Smith, Pickering and Sims, Hawkes and Spencer, Burrows and Carmichael, Carson and Toone, Page and Co., Riches and Watts, Mapplebeck and Lowe, Ball of Kilworth, Bellis and Co., the Corbetts of Shrewsbury and Market Drayton, Wood and Cocksedge, Wilkins of Ipswich, Ashby and Jeffreys, Welland of Rugeley, Tanner and Bishopp of Leighton Buzzard, Wood of Atherstone, and possibly a few more local men and agents. The seed and manure stands, on the contrary, were this season in no such force; but Proctor and Ryland were able to offer the testimony of some really good roots, while the Suttons at Reading held a show of their own on this very day, and their place was filled by Griffin and Morris, the manure-dealers of Wolverhampton. Bradford's washing-machines, again, had superseded the Dicksons' of Chester and Manchester, and the merits of sundry cattle condiments were set off by the most preposterous advertisements in the way of placards, that might reasonably have been refused admission by the management. Some of these people have proved more or less of a nuisance in Bingley Hall before now, and it would be as well that any further encroachment should be checked in time.

After the untoward season we have had, it is almost unnecessary to say that, whether as regards roots or corn, the display was not one of any particular excellence. The ten entries of white wheat included some respectable average samples of Talavera, which variety, as will be seen by our list of awards, obtained the prizes. The first-prize Golden Melon oats of Mr. Clark are very good; while the beans and peas, more especially the latter, are also praiseworthy. With excess of moisture and lack of heat the roots have not attained to the dimensions which under more favourable conditions they would have done, and it is to be feared that their general quality will not be satisfactory. In the collection of Mr. Moore, which won Messrs. Proctor and Ryland's silver cup, the six long mangolds weighed 197lbs., the six Globe mangolds 192lbs., the six swedes 66lbs., and the six carrots 28½lbs. The weights of the collection which gained for Sir William Heathcote Messrs. Griffin, Morris, and Griffin's silver cup were six Globe mangolds 182lbs., six long mangolds 163lbs., six swedes 61lbs., and four ox cabbages 194lbs. In the class for long mangolds the first-prize lot weighed 111lbs., and the second 110lbs. In the class of Globe mangolds the six first-prize specimens weighed 127lbs., and the six second-best 117lbs. Mr. Allan Pollok's six first-prize swedes weighed 92½lbs., and his second-prize ones 68lbs. The competition for the cabbage premiums were very limited, but the specimens were better than the roots. The weight of Mr. Robinson's six was 275lbs., and of Mr. Lythall's 194½lbs.

The Curzon Hall looked to be well furnished, the more particularly with pointers and setters: but on visiting the show about two o'clock in the afternoon, we were told that no catalogue could be supplied before five! Just, of course, as everybody would be leaving! Some official certainly offered to go round with us; but as we prefer to make our own observations, we declined his services, and could of course proceed no further with our proposed inspection. A more absurd arrangement it would be difficult to imagine. Either give the Press all proper facilities, or let its representatives take their chance with the general public. Why, by-the-bye, should there not be open judging for dogs, as well as for horses and cattle? And then all this petty short-sighted obstruction in the way of an independent Report would be removed.

PRIZE LIST.

SHEEP.

JUDGES.—George Cureton, Beam House, Shrewsbury.
Henry Fookes, Whitechurch, Blandford, Dorset.
Edward Gough, Gravel Hill, Shrewsbury.

LEICESTERS.

Three Fat Wethers, not exceeding 22 months old.—First prize, £15, and Silver Medal as breeder, G. S. Foljambe, Osberton Hall, Worksop, Notts; second, £10, G. S. Foljambe; third, £5, George Walmsley, Rudston, Bridlington, Yorkshire. Commended: William Perry Herrick, Beau Manor Park, Leicestershire; Christopher James Bradshaw, Alstoe House, Burley-on-the-Hill, Oakham; William Browne, Highgate Farm, Home-on-Spalding Moor, York.

LONG-WOOLLED SHEEP NOT BEING LEICESTERS.

Three Fat Wethers, not exceeding 22 months old.—First prize, £15, extra prize of 10 guineas, given by W. D. Bromley, Esq., M.P., for the best pen of long-woolled sheep, and Silver Medal as breeder, John Wigmore, Bickerton Court, Much Marcle, near Dymock, Herefordshire; second, £10, Thomas George West, Green Hill Farm, Bletchington, Oxford; third, £5, John Wigmore, Bickerton Court. Commended: John King Tombs, Langford, Lechlade, Gloucestershire.

SOUTH AND OTHER DOWN SHEEP.

Three Fat Wethers, not exceeding 22 months old.—First prize, £15, the Birmingham Linen and Woollen Drapers' prize of £10 as the second-best pen of three fat wethers, and Silver Medal as breeder, the Earl of Radnor, Coleshill, Highworth; second, £10, Lord Sondes, Elmham Hall, Thetford, Norfolk; third, £5, Lord Walsingham, Merton Hall, Thetford, Norfolk, Highly commended, Lord Walsingham.

Three Fat Wethers, exceeding 22, but not exceeding 34 months old.—First prize, £10, and Silver Medal as breeder, Lord Walsingham, Merton Hall; second, £5, the Earl of Radnor, Coleshill, Highworth. Commended, Lord Walsingham.

SHROPSHIRE SHEEP.

Five Fat Wethers, not exceeding 22 months old.—Prize 20 Guineas (given by Edwin Yates, Esq., ex-Mayor of Birmingham), and Silver Medal as breeder, Henry Smith, Sutton Maddock, Shiffnal, Shropshire. Highly commended: Lord Wenlock, Bourton Cottage, Much Wenlock. Commended: Lady Willoughby de Broke, Compton Verney, Warwickshire; Lord Wenlock, Escrick Park, York.

Three Fat Wethers, not exceeding 22 months old.—First prize £15, extra prize of £15 (given by the Linen and Woollen Drapers of Birmingham as the best pen of three Fat Wethers; extra prize of 10 Guineas, given by C. N. Newdegate, Esq., M.P., for the best pen of Shropshire Sheep in this and the following class; and silver medal as breeder), Thomas Nock, Sutton Maddock, Shiffnal; second, £10, George Anderson May, Elford Park, Tamworth; third, £5, Lady Willoughby de Broke, Compton Verney, Warwick. Highly commended: Lord Wenlock, Bourton Cottage, Much Wenlock. Commended: Lady Willoughby de Broke; the Earl of Aylesford, Packington Hall; Thomas Mansell, Adcott, Salop.

Three Fat Wethers, exceeding 22 but not exceeding 34 months old.—First prize £10, and Silver Medal as breeder, Joseph Beach, The Hattons, Brewood, and Flour Mills, Dudley. No other pen sent.

Single Shropshire Wether of any age.—Prize £5 5s. (given by Messrs. Mapplebeck and Lowe) for best Shropshire Wether, and Silver Medal as breeder. Joseph Beech, The Hattons, Brewood. Highly commended: Henry Smith, Sutton Maddock, Shiffnal. Commended: Earl of Aylesford, Packington Hall.

OXFORDSHIRE DOWNS.

Three Fat Wethers, not exceeding 22 months old.—First prize £10, and Silver Medal as breeder, the Duke of Marlborough, Blenheim Palace; second, £5, Nathaniel Stilgoe, Adderbury, Oxfordshire. Very highly commended: Samuel Druce, Eynsham, near Oxford. The class highly commended.

CROSS-BRED SHEEP.

Three fat wethers, not exceeding 22 months old.—First prize, £10, and silver medal as breeder, John Overman, Burnham Sutton, Burnham Market; second, £5, Nathaniel Stilgoe, Adderbury, Oxfordshire. Commended: Nathaniel Stilgoe.

LEICESTER EWES.

Fat ewe of any age, having bred one or more lambs.—First prize, £5, silver medal as breeders, James and Edward Findall, Knapton Hall, near Rillington, York; second, £3, Willlam Browne, Highgate Farm, Holme-on-Spalding Moor, York. Highly commended: Christopher James Bradshaw, Alstoe House, Burley-on-the-Hill, Oakham. Commended: James and Edward Findall.

LINCOLN AND COTSWOLD EWES.

Fat ewe of any age, having bred one or more lambs.—First prize, £5, and silver medal as breeder, John Henry Casswell, Laughton, Folkingham, Lincolnshire; second, £3, F. and G. West, Green Hill Farm, Bletchington, Oxford. Highly commended: John Henry Casswell. Commended: John Henry Casswell; Executors of Thomas B. Marshall, Branston, near Lincoln.

SOUTH AND OTHER DOWN EWES.

Fat ewe of any age, having bred one or more lambs.—First prize, £5, silver medal as breeder, Lord Sondes, Elmham Hall, Thetford, Norfolk; second, £3, Duke of Marlborough, Blenheim Palace, Woodstock. Highly commended: Lord Walsingham. Commended: Lord Walsingham.

SHROPSHIRE EWES.

Fat ewe of any age, having bred one or more lambs.—First prize, £5, and silver medal as breeder, Joseph Beach, The Hattons, Brewood; second, £3, Samuel Wilkes, Tong Norton, near Shiffnal.

FAT PIGS.

JUDGES.—John Moon, Maristow, Roborough, Plymouth.
John B. Spearing, Newport, Co. Mayo, Ireland.

Three fat pigs of one litter, not exceeding ten months old.—First prize, £10, Thomas L. Melville Cartwright, Melville House, Fife, and Newbottle, Northamptonshire. No other prizes awarded from want of merit.

Three fat pigs of one litter, not exceeding 15 months old.—First prize £10, and Society's extra prize of £5 5s. as best pen in this and preceding class, Major-General Hon. A. N. Hood, Cumberland Lodge, Windsor, Berks; second, £5, Major-General Hon. A. N. Hood; third, £3, Thomas Henry Ashton, Cliff Hall, Tamworth.

Fat pig exceeding 15 months old.—First prize £6, Samuel G. Stearn, Brandeston, Wickham Market, Suffolk; second, £4, Earl of Radnor, Coleshill, Highworth; third, £2, Richard Elmhirst Duckering, Northorpe, Kirton Lindsey, Lincolnshire. Highly commended: James and Frederick Howard, Britannia Farms, Bedford. Commended: T. S. Wilkins, Peddemore Hall, Sutton Coldfield; Richard Elmhurst Duckering.

BREEDING PIGS.

BERKSHIRE BREED.—Five pigs of one litter, exceeding three and not exceeding six months old.—First prize £10, extra prize £5 5s. given by Society as best pen of Berkshires, and silver medal as breeder, Joseph Smith, Henley-in-Arden; second, £5, Abraham Dixon, Birches Green, Birmingham; third, £3, John Edwards, Aston Road, Birmingham; silver medal, John King Tombs, Langford, Lechlade, Gloucestershire Highly commended: William Yells, Round Robin Farm. Highworth, Wilts.

PIGS OF OTHER LARGE BREEDS.—Five pigs of one litter, exceeding three and not exceeding six months old.—First prize £10, and silver medal as breeder, Thomas Bantock, Merridale House, Wolverhampton; second, £5, W. B. Wainman, Carhead, near Cross Hills, Yorkshire; third, £3, W. B. Wainman.

PIGS OF A SMALL BREED.—Five pigs of one litter, exceeding three and not exceeding six months old.—First prize £10, Society's extra prize of £5 5s. as best pen of pigs of a small breed, and silver medal as breeder, Samuel G. Stearn, Brandeston, Wickham Market, Suffolk; second, £5, Major-General Hon. A. N. Hood, Cumberland Lodge, Windsor; third, £3, George Mangles, Givendale, Ripon, Yorkshire.

CORN.

JUDGES.—J. Mathews, Edgbaston House, Birmingham,
Edward Davenport, Erdington.

WHITE WHEAT: Samples of one bushel each. First prize, £2 2s., John Wigmore, Bickerton Court, Much Marcle, near Dymock, Herefordshire, (Talavera); second, £1 1s., Colonel Loyd Lindsay, M.P., Lockinge, Wantage, Berks (Talavera).

RED WHEAT: Samples of one bushel each. First prize, £2 2s., Colonel Loyd Lindsay, M.P. (Nursery); second, £1 1s., Thomas Horley, jun., The Fosse, near Leamington (Nursery).

BARLEY: Samples of one bushel each. First prize, £2 2s., Joseph H. Clark, Altwood-house, Maidenhead (Golden Melon); second, £1 1s., Robert Raynbird, The Grange Farm, Hengrave, Bury St. Edmund's (Page's Prolific, second selection).

OATS: Samples of one bushel each. First prize £2 2s., Frederick Lythall, Spittal Farm, Banbury; second, £1 1s., George Dunkley, Kingsthorpe, Northampton.

BEANS: Samples of one bushel each. First prize, £2 2s., Frederick Lythall, Spittal Farm, Banbury; second £1 1s., Frederick Lythall.

PEAS (White): Samples of one bushel each. First prize, £2 2s., Joseph H. Clark, Altwood House, Maidenhead; second, £1 1s., James and Frederick Howard, Britannia Farms, Bedford.

PEAS of any other variety: Samples of one bushel each. First prize, £2 2s., Frederick Lythall, Spittall Farm (Bluefield); second, £1 1s., George Dunkley, Kingsthorpe, Northampton (Maple).

ROOTS.

JUDGES.—J. Mathews, Edgbaston House, Birmingham.
Edward Davenport, Erdington.

A silver cup, or any other article of plate, of the value of ten guineas, given by Messrs. Proctor and Ryland, of Birmingham, as a prize for the best collection of the four following varieties, namely—long mangold wurzel, globe mangold wurzel, swedes, and carrots; six roots of each to be shown for this prize alone.—John Moore, Warwick.

A silver cup, or other article of plate, of the value of ten guineas, given by Messrs. Griffin, Morris, and Griffin, of Wolverhampton, for the best collection of long mangold wurzel, globe mangold wurzel, swedes, and ox cabbage; six roots of each kind to be shown for this prize alone; the mangold wurzel to be selected from crops of not less than two acres, the swedes not less than five acres, and the cabbage to be field culture.—Sir William Heathcote, Bart., M.P., Hursley Park, Winchester.

KOHL RABI (six specimens).—First prize, £2 2s., Joseph H. Clark, Altwood House, Maidenhead, Berks; second, £1 1s., Colonel North, M.P., Wroxton Abbey Farm, Banbury (Green).

LONG MANGOLD WURZEL (six specimens).—First prize, £2 2s., Lord Boston, Hedsor, Maidenhead; second, £1 1s., Samuel Robinson, Shaw House, Melbourne, near Derby (Robinson's Improved Long Red). Commended: Colonel North, M.P., Banbury.

GLOBE MANGOLD WURZEL (six specimens).—First prize, £2 2s., John Moore, Warwick; second, £1 1s., Colonel North, M.P. Commended: Lord Boston, Hedsor.

SWEDES OF ANY VARIETY (six specimens).—First prize, £2 2s., Allan Pollok, Lismany, Ballinasloe, Ireland (Laing's Hogg and Robertson's Improved); second, £1 1s., Allan Pollok (Hogg's Select Purple Top). Commended: Zachariah W. Stilgoe, Adderbury Grounds, Banbury, Oxfordshire (Green Top Yellow); Charles Frederick Clark, Pirton Grove, near Wolverhampton.

COMMON TURNIPS (six specimens).—First prize, £2 2s., R. H. Masfen, Pendeford, Wolverhampton (White Norfolk); second, £1 1s., George Mangles, Givendale, Ripon. Commended: Allan Pollok, Lismany, Ballinasloe, Ireland (Pentice's improved Yellow); Sir William Heathcote, Hursley Park, Winchester (Grey Stone); George Dunkley, Kingsthorpe, near Hampton (Green Barrel).

Carrots of any Variety (Six specimens).—First prize, £2 2s., G. S. Foljambe, Osberton Hall, Worksop (Altringham); second, £1 1s., G. S. Foljambe (Altringham). Commended: John Moore, Warwick.

Ox Cabbage (Six specimens).—First prize, £2 2s., Samuel Robinson, Melbourne, near Derby (Robinson's Champion); second, £1s. 1s., Frederick Lythall Banbury (Robinson's Champion).

Kidney Potatoes (Twelve specimens).—First prize, £2 2s. George Dunkley, Kingsthorpe, Northampton; second, £1 1s., George Dunkley. Commended: George Mangles, Givendale, Ripon; Samuel Robinson (Prince of Wales).

Round Potatoes (Twelve specimens).—First prize, £2 2s., John K. Fowle, Prebendal Farms, Aylesbury; second, £1 1s., George Dunkley, Kingsthorpe, Northampton (Victoria). Commended: John Shackel, Blenheim House, Small Heath, near Birmingham (Red Regents).

Referee for the Ages of Stock.—Professor John Gamgee, Albert Veterinary College, Bayswater, London.

Veterinary Inspector.—Mr. E. Stanley, Stephenson Place, Birmingham.

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of this Society was held at Douch's Railway Hotel, Taunton, on Tuesday, Nov. 27. Present: John Tremayne, Esq. (in the chair), Earl Fortescue, Sir J. T. B. Duckworth, Bart., Messrs. T. D. Acland, M.P., Edward Archer, R. G. Badcock, Clement and R. H. Bush, J. H. Cotterell, T. Danger, John Daw, E. S. Drewe, T. Duckham, Mark Farrant, John Fry, Charles Gordon, John Gray, Jonathan Gray, J. D. Hancock, James Hole, T. Hussey, H. P. Jones, J. W. King, J. E. Knollys, Joseph Lush, H. A. F. Luttrell, Henry St. John Maule, H. G. Moysey, T. Pain, Rev. T. Phillpotts, Messrs. S. Pitman, G. S. Poole, James Rawlence, J. W. Sillifant, W. Thompson, E. U. Vidal, H. Williams, H. Spackman (official Superintendent), J. Goodwin (Secretary and Editor).

Falmouth Meeting, 1868.—The Falmouth Deputation reported that they visited Falmouth on the 13th ultimo, and were very cordially received and entertained by the Chairman, the Honorary Secretary, and numerous members of the Local Committee, including the Worshipful the Mayor of the borough. After a short preliminary interview the Deputation proceeded, under the guidance of the Local Committee, to inspect the sites proposed to be placed at the Society's disposal for the meeting of 1868. The site selected for the show-yard extends over an area of 26 acres, and possesses the advantages of proximity to the railway, from which a siding is to be made into the yard as shown on the plan. By an arrangement suggested by the Deputation and most promptly and cordially concurred in by the parties chiefly interested, 26½ acres of land, closely contiguous to the show yard, were guaranteed for exhibition of implements at work, and 20 acres of meadow land at a distance of about a mile for the trial of mowers and combined machines. The conditions and plans were duly signed and exchanged by the Chairman of the Local Committee and by the Secretary on behalf of the Society, after which a handsome repast was provided by the Local Committee for those who had taken part in the day's proceedings.

Salisbury Meeting, 1867.—This meeting was fixed to commence on Monday, June 10th: the entries for stock and implements to close on April 18th; those for poultry on the 10th of May.

The Stock Prize Sheet was accepted and confirmed, and ordered to be printed and circulated, subject to the condition that in case any description of Stock shall be forbidden by legal authority to be exhibited, or, if exhibited, shall be required to be slaughtered, the prizes for such stock will not be given. The Society's prizes for Stock amount to £1,100; those offered by the Local Committee to £50, with an additional sum of £100 towards the expenses of a Dog-show, supposing the Society should consider it desirable to hold one, which, however, they have decided not to do unless owing to legal difficulties or prudential considerations they are unable to hold a full show of cattle, sheep, horses, and pigs. In the prize sheet, Devons, Herefords, and Shorthorn cattle are placed on the same footing. In the sheep classes several additions have been made to those of the Hereford show: prizes are now offered for Leicester, Cotswold, other long wool, Southdown, Hampshire Down, Shropshire, Oxford Down, Somerset and Dorset Horn, and Mountain Sheep. In the horse classes there are prizes of £30 and £15 for agricultural stallions foaled before 1865; £20 and £10 for agricultural stallions foaled in 1865; £15 and £5 for mares and foals or in-foal; £20 and £10 for pairs of agricultural horses foaled before 1862; and £20 and £10 for ditto, foaled after January 1st, 1862. In the Hunter class £25 and £10 for mares or geldings foaled before January, 1863; £25 and £10 for ditto foaled in 1863; and £15 and £5 for fillies or geldings foaled in 1864. In the Hack classes £10 and £5 for mares or geldings to carry not less than 15 stones; £10 and £5 for ditto to carry not less than 12 stone; and £10 for the best mare or gelding pony, not exceeding 13 hands high.—The prizes offered by the Salisbury Local Committee are £10 and £5 for five four-teeth Hampshire Down Sheep, to be shown in their wool and afterwards shorn in the yard; and £10 and £5 for five six-teeth or full-mouthed ewes, subject to the same conditions; also, £20 in sums varying from £5 to £2 10s. for Berkshire pigs; and £3 10s. for sheep-shearing. In order to assimilate the practice of this Society to that of the Royal Agricultural Society of England, it is one of the special conditions on the prize sheet that sheep exhibited for any of the Society's prizes must have been really and fairly shorn bare after the 1st of May in the year of exhibition, and a certificate of the date of such shearing must be forwarded to the Secretary on or before the 1st of June.

The Poultry Prize Sheet was accepted and confirmed; and the Stewards of horticulture and music were authorised to make arrangements on the same scale as those of last year.

Proposed Dog Show.—The Salisbury Local Committee having offered £100 towards the expenses of a dog show, Col. Luttrell moved—"That in the event of there *not* being an exhibition of cattle at the next Salisbury meeting, the sum of £50 be granted by the Society towards the expenses of a dog show, and that a committee be named to prepare the prize list." A long discussion ensued, in the course of which the various aspects of the question were fully discussed, and eventually Colonel Luttrell's motion was carried, with the addition of the words, "but if there be a cattle show there shall be *no* dog show."

Durdham Down.—Mr. Nelson, of Clifton, having contracted for a certain sum to restore to the satisfaction of the Bristol Downs Committee the surface of the down where the Society's show was held in 1864, the official Superintendent was requested to see that the conditions of the contract were as soon as possible fulfilled.

Leave of absence was granted to the Secretary from December 18th to January 14th.

New Governors.—The Right Hon. the Earl of Cork and Orrery, Lord Lieutenant of the county of Somerset; the Right Hon. the Earl of Mount Edgcumbe.

New Members.—Messrs. C. J. Burnell, Barwick, Yeovill; Wm. Trickey, Kelston, Bath; John Coombe, West Exe, Tiverton; William Fookes, Pewsey, Oare, Marlbro'; James Stuckey, Drayton, near Langport; J. C. Pegrave, Bath; J. E. F. Wason, Englishbatch, Bath; Obed Hosegood, Dillington, Ilminster; and C. Birmingham, Allesford.

Member Increasing Subscription to Secure Full Privileges.—Mr. Richard Corner, Tornorton, Williton, Taunton

THE CONDITION OF THE FARM LABOURER.

The following paper was recently read by Mr. WILLIAM DAVIDSON, of Bunkerhill, at a meeting of the Chester-le-Street and District Farmers' Club: It has been remarked that the British labourer is the best of all tools; not as implying that the labourer is to be regarded or in any way treated as a mere machine; but that, as in music no instrument, however skilfully contrived or adjusted, can ever surpass or even equal the human voice, so no machine, however well adapted, can ever in skill or dexterity equal the human hand backed by at least a modicum of brain. Seeing then the important position occupied by the farm-servant, it may be interesting to glance, very briefly, at the condition of the farm labourer, and some things which may improve or ameliorate that condition. No class of agricultural statistics is more varying and conflicting than those relating to the labourer. To begin at the bottom of the list, we have the "Dorsetshire peasant," who is expected to keep body and soul together, to feed, clothe, and educate his family, and to pay for fuel and house rent on 8s. per week. The one who, perhaps, occupies the other end of the scale, is the north country hind who occupies a position and enjoys emoluments very different from his brethren in the south. With 15s. per week (which may be assumed as the average wage in money), free house and garden, coal, potatoes, and wheat, the farm labourer in Durham and Northumberland has a comparatively snug berth. Of course the average wage throughout the country will be found to be somewhat less than in the latter case, but as it is the rate of remuneration obtained in this district, we may assume it for the time being. I do not mean to open up the inquiry as to whether this may or may not be enough, but would rather venture to suggest that some improvement might be made on the system of equal payment. We all know the value upon a farm of a man who can not only turn his hand to everything, but who can do everything he turns his hand to well. And yet, how invariably is such a workman remunerated at the same rate as the stupidest clodhopper on the farm. A great deal has been spoken and written on the subject of labourers' cottages, but the subject has by no means been exhausted. In England I think the evil is much worse than in Scotland; the grievance principally complained of there is inferior cottage accommodation; but here, in how many cases is there no cottage accommodation at all! In how many instances are our farm labourers obliged, for want of cottages on the farm, to reside in the nearest village or town, which may be two or more miles from the scene of their labours; thus involving a serious loss of power alike to the employer and the employed. The exigencies of modern agriculture, with its improved machinery and modes of operation, absolutely require some improvement on the old-fashioned agricultural labourer, whose rule of work often was, "the way his father before him did it;" and if we are to obtain this, if we are to see our labourers keeping pace with the improvements and requirements of modern farming, they will be justified in demanding better house accommodation than has, on most estates, hitherto been afforded them. When we look at the miserable one-roomed hovels in which large families have lived and slept, can we wonder that the decencies of life are so little regarded, and immorality and illegitimacy so fearfully common amongst us? It may be objected that this subject is more fitted for the consideration of the owners of the soil than for the tenant who has only a temporary position on the farm, and who cannot be expected to invest his capital in the erection of cottages, which he must leave without receiving any compensation for the capital so invested. Perhaps it is, but it must be remembered that all outside pressure upon the landlord must come from the tenant-farmer and not from the labourers themselves. Another means of improving the condition of our labourers, and one which has not received the attention it merits, and one which, as far as I am aware, has never been tried with farm servants, is that of giving them allotments to cultivate. During the greater part of the year the labourer has a good deal of time at his own disposal, and which might be employed in culivating a quarter or even even half an acre of ground rented to him by the landlord or his own master. No doubt there would be numerous practical difficulties to be overcome before such a scheme could be fairly set agoing, but there can be no doubt of the various practical advantages which would be obtained from it; first, to the landlord, in the improvement of his soil by the use of the spade; to the farmer, by giving the labourer a direct interest in the soil, and thus, in some measure, overcoming the strong tendency to migrate evinced by our labouring population; to society at large, by the increase of food, the greater industry it induces, and the improved character it confers on the labouring man; and most of all to the allotment holder himself, by the increased camforts to his family which the profits would enable him to procure, and by enabling him to turn to good account those leisure hours which hitherto have hung so heavily on his hands, and which in many cases have been wasted and abused in the beershop. We now approach a part of our subject of paramount importance to all, viz., the better education of our farm servants. The time has, we trust, gone by when the more ignorant a man was the better servant he was accounted, and when schoolcraft was reckoned a disqualification rather than otherwise for one occupying a subordinate position. In strict justice, however, this remark can only be applied to England, as north of the Tweed, among all classes, education has always been regarded as one of the greatest blessings, and the school cherished as one of our best national institutions. In the rural districts of Scotland the average time for a youth to attend school is about six years, and although towards the close of that time he is often obliged to work during the summer, care is always taken that he spend the winter months at school. A plain but substantial English education is thus received by all, and there a man who could not read, write, and work the common rules of arithmetic, would, if fully *compos mentis*, be regarded as a disgrace to the parish he belonged to. How different it is here, where the labouring population is better able to pay for education, and enjoy at least equal facilities for obtaining it, must have been painfully and frequently apparent to most. How few of our labourers are able to calculate and write out an account of piece-work performed by them! and how many of them are obliged, when receiving payment of such, to append their mark instead of their name! It is very difficult to discover any reason for this state of things, for surely there is nothing in the general character of the people which predisposes them to ignorance, and we very much question whether for industry, honesty, or shrewdness they are equalled or surpassed by the peasantry of any country; nor will anything in their circumstances or surroundings account for it; for although the Son of Sirach says, "How can he get understanding that holdeth the plough, and giveth his mind to make furrows, and that glorieth in the goad, that driveth oxen, and is occupied in their labours, who is diligent to give the kine fodder, and whose talk is of bullocks?" There is little in their labours to depress their mental faculties, and much in the scenes with which they are surrounded to elevate their minds. We suppose that it is because they have been able to get along without book-learning; because they have never experienced the benefits—that they do not feel the need—of education. It surely, then, is the duty of every employer of labour, who is desirous of seeing a better educated peasantry in our land, to encourage everything which may tend to produce this desirable result. By inculcating the blessings of education, by discouraging the employment of boys on a farm when they ought to be at school, by encouraging the establishment of night schools and similar institutions, and by fostering the taste for reading where it has been acquired, everyone may contribute something towards the elevation of our labouring classes. When we remember that "service is no inheritance"—that the farm labourer, when disabled by sickness, or when past work, unless he has been more fortunate or more provident than the great majority of his class, must become a burden on thoso who, in all likelihood, have enough to do with themselves, or be content to spend the evening of his days in that uninviting retreat, the workhouse—we need not wonder that so many of the most active and intelligent of our agricultural labourers elect to leave the land of their birth, and endure for awhile the hardships and privations of pioneer life on the plains of New Zealand or amid the backwoods of Canada, in order that they may not only secure a competency for the present, but make that provision for old age which their circumstances prevented them from doing at home. Indeed, when we consider the strong inducements which the working-man has to carry his labour to a foreign field, we wonder that so many are content to remain at home. In either of the colonies I have named he has, if he retains his health, an almost certain prospect of not only becoming his own master, but of tilling his own acres. He will be able to bring up his family under his own roof-tree, and will eventually have the satisfaction of seeing them all settled on farms equal to his own, instead of seeing them leave home at an early age for farm service, which would certainly have been the case had he continued to be a farm labourer in England.

THE BUSINESS OF A FARMERS' CLUB.

At the dinner of the Hadleigh Agricultural Association Mr. **Hawkins** said he believed the intention of a farmers' club was to obtain an exhibition of roots for the purpose of showing a crop, and the two acres ought to be cultivated in the same way as the ordinary root-crop, and not extra-cultivated for the sake of the prize. That had always been his way, and Mr. Gurdon's too, so that when they saw the prize two acres they might see a fair sample of what the whole crop was. He was very sorry to find that that club had lately become defunct as a "Farmers' Club," and he thought they ought now to put themselves down as merely an "Agricultural Association." They had been upon the wane for a great number of years, and could not now get up a discussion upon any topic that ought to come before a farmers' club. He had felt very much disappointed at this, because some twenty years ago, when they commenced the Society, they began it with the intention of carrying out the objects of a farmers' club. They had, however, fallen away from that idea, and, as such a club, they were now a sort of nonentity. He should like them to do either one thing or another—either resuscitate this "dead man," or sink the idea of a farmers' club altogether. He thought a farmers' club ought to start with the motto adopted by the Royal Agricultural Society—"Practice with Science," these being the tributary streams to feed that great Society. The first thing such a club should possess was a good library. When their forefathers died all their knowledge died with them, because they never recorded any facts; a man spent half a lifetime in acquiring knowledge, in the other half he used it for his own benefit, and when he died his knowledge all went with him. And that was the way they would still go on, unless they adopted the system of recording results. When he looked round and saw so many young men who wanted to look into the subjects that might come before them in their avocations, he thought there ought to be books to which they could refer. It was now more essential than ever. Suppose, instead of spending fifty guineas a-year about a stock show, they were to spend thirty guineas for a set of botanical works, to make the farmers acquainted with what they saw in the fields. When they knew the habits of a plant, they knew how to destroy it; and when they knew the soil to which it was indigenous, they would know whether it would grow with their crop. He fancied that an agricultural library, giving the results of experiments, and a knowledge of what was going on, was of the utmost importance to a farmers' club. Many topics were brought before them in an erroneous point of view, which farmers' clubs ought to correct. If they had read the speeches at the agricultural meetings during the year, they would have found that the aristocracy had come to the universal conclusion that their lands were not half-tilled, and that it was owing to the ignorance and poverty of their tenants. There were a great many things that were called agricultural improvements that were not undertaken by tenants—things which their landlords thought they ought to do—because they did not know how to do them. It was the business of a farmers' club to show them. There was not a land-valuer or farmer who could get up and state the value of agricultural improvements. Suppose they took draining. Just look at the diversity of opinion that existed upon that subject. One said that a farmer who drained his land ought to have ten years' security for the improvement, and another said he ought to have twenty years. If a gentleman took a Government loan to improve his estate, he had to pay 6½ per cent. for twenty-one years, *i.e.*, 3½ per cent. for interest and 3 per cent. sinking fund; and if that principle were correct, surely a farmer's improvement must be worth twenty-one years to him. But he had never known any gentleman who was able to make interest on his money: he generally had to lose about 3 per cent., and the tenant paid it. Why was that? If they spent £100 in improvement, about 35 per cent. went in engineering, and plans, and superintendence, that was of no earthly use to the farmer. In fact, half the people who came to drain land did not know half as much about it as the farmers themselves. These were things that ought to be taken up by a farmers' club, because, whatever they might say of the aristocracy, avarice was a thing they could not bring to bear upon them; he never saw a gentleman who wished to take advantage of an improvement if he was convinced it was wrong to do so. Suppose a farmer were to drain a ten-acre field, and leave one acre in the middle undrained, and the club paid him the loss, the advantage of the drainage would be made clear; but now there was no man who could say what was the value of drainage. In very dry seasons the drain did not pay a farthing, and there was interest and compound interest to be added to the account for those years; and if a farmer had only a year's interest in the improvement, his security would be gone before he began to reap the advantage. Then, again, there was chalking and marling the land: look at the diversity of opinion there. They had seen in the *Economist* a paper on the late Mr. Pusey's tenant-right system, and this showed the ignorance of the land-valuers and land-agents examined before the House of Commons. Mr. Tollemache's steward was asked how long chalk would be of benefit to the land, and he said it would work out in about four or five years, but every farmer knew that was just when it began to pay. When men who were supposed to know things made such assertions as that, and such ridiculous answers were given, it proved that they did not know anything about it. If they would read *Corbet's Digest of Tenant Right* they would find that hardly a land-agent that was examined knew what customs prevailed five-and-twenty miles away from his home. These people were not fit to take the management of estates, and that was how the country gentlemen got so misled about agricultural improvements. Therefore he thought it was the business and the duty of farmers' clubs to enter upon these inquiries. This would be far better than having their stock show, at which there was never anything worth looking at, except two or three horses that had much better be shown at the county meeting. If they discussed these things they would be making some progress; and if they paid a farmer the expense of conducting an experiment, it would not only be money spent, but also knowledge gained. There was one thing that must force itself upon the landed proprietors, viz., the position of tenants and labourers. There had been long discussions about paying low wages, and Mr. Girdlestone wrote about the wages in Devonshire; but Mr. Brereton had taken up the subject, and based his arguments upon political economy, which was the only thing a man could do to estimate the value of labour. The farmer had no more control over the price of labour than the manufacturer, or anybody else. Now they could not secure much labour on their farms except that of a migratory kind: they were men who lodged at beer-houses, and if they read one evening in a penny paper that good wages were given fifteen miles off, the next morning they were off. Other men did the same thing, and so it happened that just at this focus there were four or five times as many men as were wanted. That could not be the case if they had sufficient cottage accommodation, because they would then be able to make their men comfortable and well off. But as long as they had that migratory class of labourers, the moment they heard that haymaking was begun by somebody who was a week earlier than themselves they were off, and they had to depend upon men who came up from more backward districts. That was a thing that must force itself upon the consideration of the agricultural classes of the country.

MIXED HUSBANDRY—PROGRESSIVE INDUSTRY.

A community which expends all its energies in the production of a single especial crop or article of manufacture, is largely dependent upon other localities for supplies of various needed articles; and in case of failure in the crop, or a bad market, such community is liable to great distress, and oftentimes severe suffering. Now, if instead of trusting their whole dependence upon a single article of production, they had divided their energies among several, a less risk of loss or distress would be occasioned by the failure of any one, as then there are others upon which to fall back. We find in the long run that a diversity of products is more steadily and surely productive of prosperity and wealth than if the same energies were expended in the production of a single article. Perhaps with everything favouring, a more rapid road to independence would be in the production of especial crops; but often when we make our best efforts, and lay the most feasible plans, we meet with failure: either the season is unpropitious, insect enemies destroy the crop, diseases cut it short, or, when grown successfully, the market rates are below our expectations, and often so low as to leave no margin for profit, if we do not meet with an actual loss. Here we find the absolute necessity of "farm book-keeping," or a system of accounts whereby we may see at a glance what the expense of producing any crop is. We then can tell for how little the product can be sold and yet pay a profit.

In the diversity of productions we are pretty certain if one fails in any particular, that others will succeed; and if our profits on an individual crop are less than when only a special one is produced successfully, yet in the aggregate and long run we are as sure of a competency as with the single production, and the moral results are very much better with moderate, steady accumulation than with the uncertain sudden proceeds from a single special production. To what are the people of the United States indebted for the unparalleled success attendant upon, and resulting from their industry as a nation? Without a doubt, I would answer, upon the diversity of their industry and productions. We often see or hear much written or said upon this or that branch of business as being the most important, or the foundation of all the prosperity and success in building up a nation, and that if that fails all fails; but the fact is, one is dependent upon another. No one alone would produce such surprising results. Supposing all were engaged in agriculture, what would be done with all the productions of the earth? Would the mere accumulation of such productions constitute any valid wealth? The answer may be found in the asking the question. Were it not for the productions of the agriculturist where would the manufacturer be?' and if no manufacturer, where would be the merchant? If no merchant, manufacturer, or agriculturist, where would the commerce of a nation be? Echo answers, Where?

The pioneer pilgrim-settlers of our country, after first providing for their immediate necessities, began to cast about to see what could be done to better their condition. They found their only practical and speedy betterment could be accomplished by collecting or producing articles that might be exchanged for other necessaries of life in "Fatherland." This tended to start trade and commerce; as inhabitants increased, grain, as the easiest and most natural production, was raised beyond consumption, which was readily taken in exchange for manufactured articles by merchants, and by other older nations; this laid the foundation of our extensive grain production and trade, which has eventually opened up, or rather has been the leading agency in opening up, the largest proportion of our settled territory; and as population increased, production increased apace; other articles of production and commerce were added to the agriculturist; manufactures of various articles of necessity and virtù were commenced in a primitive way; as manufactures and other industry increased, other new openings were made to the agriculturist, other and new articles were added to his productions from the soil; the raising and fattening of cattle and hogs to economise the marketing of the surplus grain and to supply meat for home consumption and export, was entered into; cotton and wool, with other textile fabrics, were produced to help supply, and build up manufactures and commerce. These in turn demanded a class of mechanics, &c., which became consumers of agricultural products, thus making further demands for a greater production. In this way we went on increasing in production and wealth till we have reached an enviable position among the nations of the world, adding from time to time new productions from the soil, new manufactures and other enterprises developed, each in turn growing out of the other, and also dependent upon the success of each other, so that what affected one was felt to a greater or less extent by all.

This dependance may be illustrated from deductions drawn from our experience as a people during the late unhappy civil strife which we have been engaged in as a nation. The effect has been to cut off supplies of some leading articles of production of the soil, &c., and the necessary substitution of others. This produced the natural result—all other interests became deranged, other sources of supply were necessarily resorted to, developing new interests and resources. The supply of molasses and sugar became short, and agriculturists sought to devise some substitute for the former production that might be more universally produced. This served to develop an article which had been partially introduced into culture since the census of 1850, viz., sorghum, or northern sugar cane. By the census statistics of 1860 we find there were produced 6,749,123 gallons the preceding year, since which time the production has rapidly increased. The approximate amount of sugar and molasses derived from this source for the last year I have no statistics at hand from which to determine; but from the fact that it is largely produced in nearly every State, the increase cannot be inconsiderable. The supply of cotton from within the region of cotton production in the United States being cut off, substitutes were necessarily sought for; other nations sought for new sources of supply who before depended upon us. The result to us of the Northern States is an increase of sheep, and a greater production of wool—new interest in producing other textiles that might be substituted for cotton. This has enhanced the profits of the agriculturist in producing wool, flax, hemp, &c., and partially developed new enterprises. The number of sheep has increased from 22,471,275 in 1860, to 32,695,797 in 1866, with a corresponding increase in quantity of wool. It might be profitable and entertaining to still farther follow up this opening and developing the different interests that have been enhanced or otherwise by the occurrences of the past, but I pass to the progress made in opening up new farms, their increased value, &c., for the period intervening from 1850 to 1860.

By statistics of 1850 there were of improved and unimproved lands in farms 293,560,614 acres, averaging in value near 11 dollars 11 cents; in 1860 they increased to 407,212,538 acres, and at an average value per acre of a little over 16 dols. 31 c.—the increase in agricultural and other products keeping in about the same ratio. The number of farms increased in the same period from 1,449,073 to 2,044,077; the average area of farms decreased from 203 acres in 1850 to 194 in 1860—the population increasing 8,251,446; the increased production of agricultural products being in greater proportion, the producers having been greatly aided in the performance of their labour by the use of improved machinery, the value of the same having increased from 151,587,638 dols. to 247,027,336 dols. This increase of machinery comprises great variety and numbers for convenience and labour-saving, enabling the cultivator to perform a much larger amount of labour with a less amount of physical force. The value of live stock during this period has more than doubled; the orchard products have increased in value about 12,000,000 dols.; the value of the productions of market gardens has increased over 10,200,000 dols.; and the increased production of wheat, rye, and corn amounts to over 293,000,000 bushels. The production of wine has risen from 221,250 to over 1,860,000 gals.; the value of slaughtered animals has increased 100,450,000 dols. This increased production and enhanced value has all happened with a rising market and increased consumers, the benefits of which inure to the producers. We here see that notwithstanding a great addition has been made to the area under cultivation, and much larger crops have been raised, that the cultivator has been enabled to realize larger prices for his products; his lands have increased in value, while he has been not only adding improvements to his possessions, but has cultivated and improved his mind, as shown by the attendant results, thus elevating his profession.

All these results we find attendant upon a time of peace, prosperity, and moderate prices; and thus shall we ever find that the intelligent agriculturist will be rewarded for all his labours, not only in a pecuniary point of view, but, what is of more inestimable value, his health, habits of industry and morality, are preserved; his declining years are solaced by the unobtrusive attentions and affections of his offspring, who, under judicious training, have grown up around him, contented to believe that no other occupation is more conducive to independence, happiness, and all their attendants.

WM. H. WHITE,
in American Country Gentleman.

South Windsor, Connecticut.

STRANGLES IN HORSES.

Strangles has this year been unusually prevalent in many localities, and has exhibited great irregularity and severity of character. Its name is an apt one, derived from its tendency to cause strangulation or suffocation. It is peculiar to horses—mostly affects young animals, and very frequently occurs shortly after they are subjected to the confinement and artificial management of the stable. Like murrain in cattle and sheep, and scarlet fever or measles in the human subject, it has all the characters of an exanthema or eruptive fever.

Strangles first presents itself with the ordinary symptoms of a cold; the animal is dull, its eyes are weak and watery, from its nose there flows a muco-purulent discharge. The throat is tender and sore, and food and water are swallowed with difficulty. The coat stares, the surface heat is irregular, and the animal feverish. In the language of the stable the colt is "breeding strangles." Soon there forms in the cellular tissue underneath the lower jaw, or in the substance of the sub-maxillary glands, a hard tense nodulated swelling. Increasing in size it interferes with swallowing and even with respiration, but in a week or nine days it softens and bursts, when the patient is at once relieved. Such is the normal course of an ordinary case of strangles. Sometimes, however, the symptoms are more serious. The abscess forms very tardily, the parotid glands underneath the ear, and those at the root of the tongue and on the pendulous palate are much enlarged: the mucous membrane of the larynx is also inflamed and sometimes becomes ulcerated. The head, tongue, and all parts about the angle of the neck are much swollen and very tender; swallowing and breathing are consequently impaired, the continued irritation and abstinence from food greatly reduce the strength, and such serious cases, if neglected, prove fatal from typhoid fever and exhaustion. After death there is found in such cases inflammation, ulceration, and even sloughing of the mucous membrane and glandular structures of the mouth and throat; the veins leading from the slowly formed abscess are filled with pus; whilst the lungs also contain purulent matter and imperfectly coagulated lymph. From imperfect nutrition the muscular tissues adjoining the inflamed parts are pale and wasted, and even where recovery takes place this wasting sometimes affects the muscles of the larynx, giving rise to roaring.

A large proportion of the serious cases of strangles are connected with the irregular appearance of the abscess, which, instead of coming underneath the lower jaw, presents itself about the parotid glands, in the lymphatic glands at the lower part of the neck underneath the shoulder, in the inguinal glands, or worst of all in the mesenteric glands, in those within the chest, or even in the interior of the brain. Such cases are ushered in by the usual signs of cold and fever, but little if any swelling appears underneath the jaws; or if the abscess forms there it does not come properly to maturity, and the animal continues dull, unthrifty, and ailing; his appetite is capricious, and his breathing and pulse are quickened. Where strangles prevail and a colt exhibits for a week or ten days symptoms such as these, it may be safely presumed that matter is forming in some irregular site. The precise locality of the deposit is usually indicated by distinctive symptoms. When about the shoulder, by stiffness, lameness, and swelling; when in the mesenter, by indigestion and colic; when in the chest, by cough and accelerated breathing; when in the brain, by dulness and increasing stupor.

The development of these irregular abscesses usually depends upon the patient being exposed to cold, wet, or other debilitating influences, whilst the disease is either coming on, or during the earlier stages of its progress. The occurrence of the disease in any particular spot is usually determined by some local weakness. Amongst my own horses I had this year two illustrative cases. A promising grey three-year-old cart colt received a tread, slightly injuring the coronary substance of the off hind limb, but not incapacitating him for work. In a few days he failed from strangles, the submaxillary swelling was however very slight; but the injured hind limb swelled up almost as in a case of weed, and the inguinal glands were extremely hard and tender. During four weeks abscesses formed in these inguinal glands, in the lymphatics above the point of the hock, and in the scrotum; the patient was much reduced, but slowly recovered, and is now in perfect health. The second case was that of a three-year-old cart filly which was put to a young Clydesdale stallion, was in consequence somewhat torn, and had a discharge from the vagina, and considerable external swellings. Just then the other young horses in the stable had strangles, of which, however, she showed few of the usual distinctive symptoms, and no submaxillary swellings, but abscesses instead appeared on either side of the vulva, about the perineum, and in the mammæ. These were opened so soon as they were ripe, and in ten days the mare appeared to be going on satisfactorily, when, unfortunately, she was turned out for a few hours to grass, was exposed to rain, caught cold, and became very lame, her hind limbs were swollen and tender; and in spite of fomentations, and the free opening of the perineal abscesses which again appeared, the mare in a few days was unable to stand; she became paralysed, first in one and then in both hind limbs, was slung for ten days, but continuing to lose strength and flesh, and showing no signs of returning power in her limbs, she was destroyed. On *post mortem* examination the lungs, bowels, and kidneys were found perfectly sound, but the mucous lining of the vagina was inflamed; underneath the lumbar vertebræ there was a large abscess which contained nearly three quarts of thick flaky pus; around the abscess the parts were inflamed, and infiltrated with matter; another abscess was found deep underneath the muscles of the groin, whilst the glands about the perineum and the mammæ were also enlarged, and filled with pus and degenerate lymph. Such cases show how local causes determine the irregular development of the abscess of strangles, and indicate moreover the great importance of protecting young horses that may be "breeding strangles" from colds and other causes of disease.

Strangles is extremely uncertain in its severity. Some cases, especially those occurring amongst colts at grass, are so slight that the animal scarcely appears ailing, never ceases to feed and requires no treatment whatever. Some cases, on the other hand, are extremely severe and tedious, and liable to such complications and irregular appearance of the abscess that they reduce the patient to a skeleton and jeopardise life for weeks. These serious cases are most frequent in seasons like the present, when from unexplained causes influenza prevails, and they attack especially young horses that have been hardly worked and confined in warm overcrowded stables. The type or character of the disorder, whether that be slight or serious, is generally preserved throughout a particular season or locality. Age has little influence on the severity of strangles. Sucking foals a few weeks old occasionally take it, and sometimes require much nursing and support to pull them through. They are, however, less prone to catch it than when a year or two older. So large a proportion of horses take the disease before they reach the age of five that fewer cases occur after that age.

Authorities differ as to the nature of strangles. Hurtrel d'Arboval, and other eminent French writers, regard it merely as a sort of catarrh or cold in the head. Dupuy and others treat it as a scrofulous disorder; but Blaine, Percival, Professor Dick, and other competent veterinarians more properly regard it as an eruptive fever or exanthema similar to small-pox, scarlatina, and measles, in the human subject; and to murrain or the apthous epizootic of cattle, sheep and pigs. Like these diseases it is characterised by fever and eruption, which run their definite courses and cannot with propriety be checked or actively interfered with. It seldom occurs more thrn once in a life-time, for the first illness usually shields the patient from a subsequent attack. It spares few individuals, all horses taking it at one period or another, usually below the age of five It often spreads epizootically, but is frequently propagated by contagion.

Although firmly believing in the contagious nature of strangles, we do not pretend to assert that all cases are thus caught. It is very well ascertained that cases of small pox, scarlet fever, or any other notoriously contagious disease frequently occur quite independently of any contagion; and so it is with strangles. In slight cases running a rapid course, and especially occurring in the open fields, the contagious power of the disease is probably at a minimum. And yet how often, even under such circumstances, do we find the disorder spreading amongst those horses brought into close contact with the sick! Every agriculturist can recall cases of colts purchased perhaps at a fair, turned into a grass field, shortly failing from strangles, and communicating the disease to their fellows in the same or adjoining pastures. Frequently a young horse is seized with the disease soon after it has occupied, it may be for only a few hours, the stable in which a strangles patient has been located. The disease has even been communicated to healthy animals from their drinking at troughs used by the sick. One horse will often infect in succession a number of others brought in contact with him or with some of his "belongings," as with the stall he has occupied, the harness he has worn, or more likely still with the hay or other food on which he has breathed or slavered; and his influence in spreading the disorder is the more apparent as the several animals infected usually have the complaint in a form similar to the original case. Contagious as the disease certainly is even under the most healthful influences, it is doubly so when it is of a low protracted type, when it severely affects the mucous membrane of the upper air passages, when it accompanies or follows influenza, and when it appears in close ill-ventilated stables.

But although frequently traceable to contagion, strangles also occur without any such direct cause. Indeed, there appears in most young horses so strong a predisposition to it that it will sometimes break forth without any very obvious exciting cause. In other words, there seems to exist in the system of the young horse a *mutories morbi*, which under the influence of contagion, change of hygiene, domestication, or other such causes, appears, according to the chemical school of pathology, to establish in the blood a species of fermentation; nutrition is thus impaired, secretion and excretion are disturbed, dullness and fever follow, the animal, in the apposite language of the stable, is "breeding strangles," whilst the morbid products thus formed are got rid of in the eruption or abscess. We thus come back to the opinion of some of the early authorities, and regard strangles as a "critical" disorder, by which, as old farrier Gibson phrases it, "somewhat obnoxious to the system is discharged."

The disease cannot be checked or put back; no antidote is yet known by which the specific blood-poison can be naturalized; and the rational treatment must obviously be to expedite its rapid removal. This nature endeavours to do mainly by the maturation of the abscess underneath the jaw; and this is best encouraged by fomentations. These are more conveniently applied than poultices, and are more soothing and effectual than blisters. Cloths wrung out of hot water properly attached over the swelling, and continually kept at a temperature many degrees higher than the body, were highly recommended by the late Mr. Barlow, who thus sensibly and forcibly writes in the *Veterinarian* for October 1854:

"Hot water dressing is grateful, does not irritate, favours exudation, is easily applied, and unlike a filthy blister is easily removed, so that we can feel the tumour as often as we please without inflicting pain. I have generally noticed that the tumour suppurates most freely and speedily when the patient drinks and eats tolerably well. One now and then meets with cases where a blister is applied almost every day in order to hasten the abscess; instead of doing which, it prevents feeding, induces weakness, and defeats the intended end. On bathing the part for a few hours external soreness is removed, and the patient often inclines to eat. In point of fact, the moving jaws, external heat with moisture, and increasing strength combined, do truly hasten suppuration."

When the swelling is great, and the breathing embarrassed, besides fomenting the hard tense tumour it is advisable to steam the patient's head by causing it to be held over a bucket containing either a hot mash or a frequently-replenished supply of boiling water. When the glands about the throat swell up so seriously as to threaten suffocation, tracheotomy is occasionally successfully resorted to. An incision is made about nine inches below the larynx, and where the windpipe is lightly covered with muscle a portion of the tube (about three-quarters) is removed, and a piece of gas piping secured in the opening, through which respiration is comfortably performed until the inflammation and swelling abate.

To ensure the rapid and healthy formation of the abscess, attention must be paid to the general health. The difficulty of eating and the retention of morbid matters in the blood rapidly tend to weakness, and this must if possible be prevented by allowing the horse any soft nutritive food he fancies. Steamed oats, a handful of clover or vetches, a few slices of carrot or mangold, a little malt, or linseed gruel, will often tempt the capricious appetite, especially if occasionally varied, offered at intervals, and not allowed to lie long untasted before the patient. A piece of rock salt should be placed where the animal can easily get at it, and cold water allowed without stint. If the animal be confined, he should have an airy and commodious loose box, and his appreciation of cool pure air is evident enough from his always standing with his head towards the open door or window. In winter, or at other seasons if the animal appears cold, his body may be clothed and his legs bandaged. But the supply of cool air to the lungs must not be interfered with: it is refreshing and invigorating to all sick animals, and often promotes recovery more effectually than any medicine. With mashes, laxative food, and clysters, physic is seldom necessary; and it must be remembered that in strangles the bowels are so sensitive that two or three drachms of aloes will be a full dose, but it must not be used unless the torpidity or constipation be obstinate and continued. Half an ounce of nitre, which will usually be readily taken dissolved in a bucket of water, should be repeated every second or third day. It promotes the action of the kidneys and skin, which should also be kept in a state of healthy activity by daily grooming, and by the use of such clothing as appears suitable from the state of the weather and the previous management of the horse.

So long as the animal continues to eat and drink he rarely requires strengthening medicine; but when his appetite fails or he has difficulty in swallowing, or where successive abscesses form, he should have several times daily a quart of good sound ale given either alone or with some well-boiled gruel. For sucking colts and young animals nothing is so good as the gruel repeated four or five times daily, and mixed each time with three or four ounces of port wine. Such management, begun early, with the steaming of the head and the local use of the hot-water cloths, has saved many young colts.

With fomentations or hot cloths, and liberal feeding, the abscess is generally ripe in eight or ten days. It may either be allowed to burst of its own accord, where there is little risk of any permanent enlargement or any thickening of the skin, a vent being given to the matter by scraping the softened skin with the finger-nail; or if the swelling is tardy in coming to the surface, but is nevertheless soft and fluctuating, it may be cautiously opened with the lancet or bistaury. Until the swelling is entirely reduced the opening should be kept open by a pledget of tow. The appetite and ability to eat, although previously indifferent, are speedily restored; with plenty of good food recovery is rapid; and the colt is frequently noticed to grow and thrive better than it did before it was attacked.

SAND AND ITS MASTERS.

Under certain conditions, the sands which underlie the waters of the ocean, and have been formed either by agencies no longer in operation, or by running waters and other existing phenomena, heap up dunes or hillocks, and ridges along the shore. This apparently simple process is thus analyzed by Jobard: "When a wave breaks, it deposits an almost imperceptible line of fine sand; the next wave brings also its contribution, and pushes the preceding line a little higher. As soon as the particles are fairly out of the reach of the water, they are dried by the heat of the burning sun, and immediately seized by the wind and rolled or borne farther inland. The gravel is not thrown out by the waves, but rolls backward and forward until it is worn down to the state of fine sand, when it, in its turn, is cast upon the land aud taken up by the wind." This ordinary action is, of course, greatly intensified whenever a storm arises from the sea.

The sand, thus transferred from the control of the waters to that of the air, is urged forward by the breezes, and rolled up the gentle ascent of the shore, until plants, pebbles, or other slight obstructions arrest its course, and permit the accumulation of a heap. In this way an irregular line of somewhat conical hillocks is formed, which may reach a height of even 500 or 600 feet. By the same agency a second row of dunes is built up within the first, and then a third and a fourth, until these natural ramparts may form a belt of fortifications several miles in width. Thus does the ocean rear mighty and effectual barriers against its own incursions.

But "forwards!" is as truly the motto of the sand-dune as ever it was of old Marshal Blucher, and the hillocks of the shore may become as formidable invaders as the sand-waves of the desert. The blown dunes advance landward often at a rapid pace, and if not arrested in their course, fields are rendered barren, plantations buried, and the dwelling of man overwhelmed. Instances of this on a scale of alarming magnitude may be found on the coasts of France, Prussia, and Denmark, and the total area of the sand-dunes of Western Europe has been estimated at nearly a million acres. This enormous extent of sand-covered soil would have been far less had man learned to imitate nature—a lesson which he has had to be taught in the bitter school of experience. Where human agency has not interfered, the sand-dune and its counterbalance, if we may so speak, may often be found side by side. The rampart heaped up by winds and waves needs but to be consolidated to become a benefit instead of an injury. This is accomplished by the quiet but mighty influence of vegetable life.

A goodly number of plants hasten to make the arid ridge their chosen habitat. Chief among them is the sand reed (Ammophila arenaria), provincially known as the marram or bent, a humble rush, growing to a height of but a couple of feet, but sending its root fibres to a distance twenty or thirty times as great beneath the ground, binding together the loose and incoherent soil. It flourishes only in an atmosphere charged with saline particles; and the seemingly barren sand is to it a rich and nutritive earth. Having accomplished its special work, that of arresting the drifting mass, this lowly plant withers and dies, and adds to the soil its quota of fertilising matter, preparing the ground for other races of vegetable organisms, so that at length "the wilderness" may "become a fruitful field," even by means of agencies apparently so inadequate. But man's interference with these natural compensations has furnished a singular and instructive chapter in the history of physical geography. The Sand Reed is found to possess various economic properties. Cattle feed on its leaves, and poultry upon its seeds, which have also been made into a coarse kind of bread; its fibres yield material for cordage, its roofs are fitted for fuel, and the entire plant is used for thatching. With a degree of blind improvidence scarcely credible, the plants thus given to check impending injury to field and dwelling are recklessly torn up by the roots, to satisfy the necessity or convenience of the moment. This practice has been continued for centuries; and there is reason for supposing that the present condition of the coasts of France, Prussia, and the Netherlands, already alluded to, is due to the destruction of dune-plants in past ages.

"Before the occupation of the coast," says Mr. Marsh, to whom we are indebted for several of the foregoing facts, "by civilised and therefore destructive man, dunes, at all points where they have been observed, seem to have been protected in their rear by forests, which serve to break the force of the winds in both directions, and to have spontaneously clothed themselves with a dense growth of the various plants, grasses, shrubs, and trees which Nature has assigned to such soils. It is observed in Europe that dunes, though now without the shelter of a forest country behind them, begin to protect themselves as soon as human trespassers are excluded, and grazing animals denied access to them."

Among the dunes of our own island, those of Cornwall have acquired an interest in antiquarian eyes, from the disinterment, some thirty years since, of an ancient church and oratory at Perranzabulo, which the drift had hid for centuries. The Scottish coast also furnishes some remarkable deposits: in one of them lies buried what Hugh Miller graphically termed "an ancient fossil barony," with remains of a manor house and its humbler surrounding cottages; and it would appear that the catastrophe thus geologically recorded was due to the wasteful ignorance of the former peasantry of the district. For an act of parliament of the time of William III details the mischief occasioned by the "bad practice of pulling the bent and juniper," and strictly prohibits such destructive acts in future. Similar legislative measures have had to be adopted in continental countries. In one instance, however, the fault was certainly not with the people. King Friedrich Wilhelm the First, of Prussia, being sadly in want of cash, a certain Herr von Korff, a devoted Bismark of the olden time, offered to fill the royal purse to overflowing if he were allowed to remove something quite useless. The delighted monarch at once gave his royal consent (as who would not to such a proposal?), and the loyal Herr proceeded to strip the sand-hills of the "Frische Nehrung" on the coast of the forests which clothed and consolidated them. He sold the timber, raised the money, relieved his sovereign, set free the sands to march inland, fill harbours and channels, and damage fisheries, and thus completed an enterprise which the state would now give millions to undo. It is only of late years that nations have woke up to a sense of the folly and danger of an indiscriminate destruction of vegetable life. On the Continent the nature, laws of formation, and means of control of sand-dunes have been carefully studied, and various reparative measures adopted, mostly at public expense. The natural vegetation of dunes appears to be remarkably extensive; those of Jutland having been found to yield above 230 species, and those of the Prussian coast two-thirds as many.

Practical men have anxiously investigated the best methods of stimulating and accelerating these growths, and both in the old and new world the sand reed and plants of similar habit have been axtensively planted on moving dunes, and afterwards, when a soil has been formed, shrubs and trees have been established on the once shifting and arid wastes. The Birch in Denmark, the maritime pine (P. maritima) in France, and the ailanthus (A. glandulosa) in Russia, have been employed for this purpose with great success. Many thousands of acres have thus been reclaimed, and modern science has made some progress in repairing the mischiefs wrought by ignorance in days gone by. Thus, educated man asserts his superiority to Nature by improving upon her processes. Yet, we repeat, the history of sand-dunes is but an elaborate comment on the truth that if we would make Nature our friend, when she seems most adverse to our interests, it must be by a reverent study of her laws—the laws of her all-wise Creator, and an humble imitation of her methods.—W. H. GROSER, B. Sc., in *Science-Gossip*.

THE THREE MODES OF PRESERVING SOUTH AMERICAN MEAT.

The question of meat supplies becomes so pressing, and the price of those which are accessible rises so rapidly, that we cannot wonder at the formation of more than one company to utilise the flesh of the South American cattle that have hitherto been slaughtered for their hides alone. A report has been made to the Foreign Office on three methods adopted by as many companies, and we propose to summarise these methods for our readers. Mr. Ford, the writer of the report, says that the superabundance of meat produced in the rich pasture lands watered by the River Plate and its tributaries is such that even now first-rate joints are sold at Buenos Ayres by the piece and not by weight, a leg of mutton costing 10d. or 1s., and beef being comparatively cheaper. From the number of hides and the amount of wool exported last year, he calculates that there must be a stock of twenty-two million cattle and thirty-five million sheep in the countries bordering the River Plate, and of this stock about 12 per cent. is slaughtered yearly. If any use has been made of the meat it has been by the conversion of it into jerked beef or "charqué." Much of this is exported to Brazil and Havana, is the staple food of the negroes, and is a great favourite. But whether it was improperly prepared, or naturally distasteful to Europeans, the charqué that was sent to England was ill received, and all attempts to introduce it proved a failure. Mr. Ford understands that if it had been shipped in a wet state and well stowed it would have been perfectly sound on its arrival. He admits, however, that cheap and wholesome as it may be, its mode of preparation deprives it of much nutritive property. The meat is cut into thin slices, immersed in strong brine, and laid down in salt for two days; but one of the results is this, that the brine absorbs much nutriment, and by the time the salt has penetrated to the centre of the slice, the outward parts are almost destroyed by the excess of salting. The processes which have succeeded to this are those of Mr. John Morgan, Baron Liebig, and Messrs. Paris and Sloper, and each one in its way has proved more or less successful.

Mr. Morgan's process, which has been patented and is worked by a Company, is based on forced infiltration, and is extremely simple. It acts by the adoption of the circulatory system as a means for introducing brine into the tissues, and in this way it demands little labour and inexpensive machinery. The animal, if a sheep, is killed by a blow on the head; if an ox, by the insertion of the point of a knife at the back of the head, which severs the spinal cord and causes instantaneous death. The chest is then sawn open, and kept so by a cross-piece of wood, and the heart is exposed. An incision is made in the right ventricle and another in the left, the blood being allowed to escape; when it has ceased flowing, a pipe with a stopcock is introduced into the incision in the left ventricle of the heart, and so into the aorta or great vessel leading through the body, and is there firmly retained. This pipe is connected by a gutta percha flexible tube to a barrel containing the fluid to be injected, which is composed of water and salt (one gallon of brine to the cwt.) and a quarter to half a pound of nitre, carefully refined, and fixed at an altitude of from 18 to 20 feet. The briny fluid being let on rushes out at the right side of the heart, after traversing all the circulatory organs, clearing the vessels and capillaries, and preparing the body for the second stage, which is performed by closing the incision in the right side of the heart with a sliding forceps, and thereby rendering the circulatory system perfect, with the vessels free and ready to receive the preservative fluid. A few seconds suffice for the brine to infuse the whole body, when by cutting the ear or hoof of the animal, a stream of clear pure brine, untainted by a single particle of blood, will instantly be seen to flow.' An ox can be preserved in ten minutes, and a sheep in less time, while by mixing phosphoric acid in the fluid to be injected, antiscorbutics can be added to the flesh, while the natural juices are retained. Operations were commenced in the month of May last year, and since then 500,000 lbs. have been shipped to Liverpool, being sold at 4d. a lb., and eagerly purchased. Still, it is reckoned that at present this price is barely remunerative, owing to the heavy expenses attendant on the establishment of a new business. A suggestion has, however, been made by the local manager of having vessels fitted up for the express purpose of meat transport, so as to save the barrels, which now form the heaviest item. If this is done, and the working placed on a sound basis, it is thought the present price will leave a fair profit.

Baron Liebig's process differs from that of Mr. Morgan, as the meat instead of being preserved whole is reduced to an essence. After the animal has been killed, the flesh is left to cool for 24 hours; it is then placed in round iron rollers with points inside, which are turned by steam, and reduce the meat to a pulp. The pulp is thrown into a large vat of water and steamed for an hour. It is then passed into a trough-shaped reservoir with a sieve at the bottom, and the gravy oozes through this into another vat, where the fat is drawn off. Now the pure gravy is put in open vats supplied with steam pipes and with bellows on the surface, which produce a blast so as to assist evaporation and prevent condensation. After six or eight hours of this process the stuff is passed into a filtering vat, out of which it emerges in the form of extract of meat, and is ready to be packed in tins. It partially hardens when cool, but is still in too fluid a state to be used except as stock. But as stock it has peculiar excellence; the bulk is small, which adapts it for military or naval use; and its purity and absence from grease fit it for hospitals or invalids. Its strength may be estimated from the fact that 33 lbs. of meat form 1 lb. of essence, and 1 lb. of essence will make soup for 128 men. Eight small tins hold the concentrated alimentary matter of an entire ox, and will make more than 1000 basins of good strong soup. A tin containing 1 lb. of the essence can be sold for 12s. 6d. in London, and we may add from our own experience is sold for 18s.

The remaining process is that of Messrs. Paris and Sloper, by which the meat is to arrive in England in the exact condition of fresh-killed butchers' meat, and at a price which would make an English butcher kill himself. The method adopted is the destruction of oxygen in the vessel where the meat is packed; all bone is extracted from the meat, but the fat is left. "From the tins in which it is placed, the air is exhausted by means of water forced in at the bottom, which, when it reaches the top, is allowed to redescend and run off, and the vacuum thus left is filled from above by a certain gas, the composition of which is kept a profound secret. The two holes at top and bottom are carefully soldered down, and the meat is then ready for exportation. The only risk it runs is from leakage, the smallest opening in the tin case proving destructive, by allowing the gas to escape and the air to get in." Samples of beef thus preserved were taken out from England, and on being tasted by members of the Argentine Government were declared quite the same as freshly-killed meat. A dinner was also given in London the other day with much the same result. And as this meat too is to be sold at 4d. to 5d. per lb., the effect of throwing open such a market to the English poor will be inappreciable. Each of the processes seems to have its peculiar advantages, each being addressed to one class more than another. Of course, Baron Liebig's process has its especial feature, while the methods of Mr. Morgan and Messrs. Paris and Sloper are more fit for the general community. But the want of invalids and armies on the march is for something strong and portable, and with the existing scarcity of food it is not easy to provide what is comparatively a luxury, though to those who use it it is a necessity. Meat itself we fear threatens to become a luxury where it has been a necessity, and it will soon be impossible to keep up the proper supply of food for all classes, if even those who are in comfortable circumstances have to expect a deficiency. If the process of Messrs. Paris and Sloper succeeds, there can be little doubt that some reduction in price may be forced upon our butchers. It has been shown that their gains must have been enormous ever since the outbreak of the cattle plague; and if wholesome palatable meat can be brought into competition, they must choose between losing custom and abating their profits. Mr. Morgan's process will be of use to many who now have to forego meat from reluctance or inability to pay the price demanded. But corn beef would not drive butchers' meat out of the field, and while butchers meat has an undisturbed monopoly we are necessarily in the hands of the butchers. We may look to the South American market as giving us a chance of rescue from our tradesmen, and as opening up a prospect of food for our poorer classes.—*The Economist.*

PARISH ROADS.

SIR,—I suppose we are all agreed that the minimum of friction, jarring, and jolting is desirable as a matter of comfort and economy. Many an old vehicle and horse might last years longer on a level, well-made road, although they would soon come to grief when encountering the "jogs" and "jounces" of ill-made parochial roads, of which I am sorry to say there are still too many, even in my own neighbourhood. As turnpikes are now just abolished, one naturally asks the question—Are these excellent highways (now that they have come into parochial management) to be assimilated to the ill-conditioned state of our local roads and byeways? If so, road travelling will be still further discouraged. There are still gross and flagrant errors and omissions in parish-road management that merit our censure, especially as they are both costly and injurious to traffic.

For instance, a quantity of gravel is shot down and spread, but never again attended to in any way. Horses soon establish a smooth foothold in a deep middle furrow, and a smooth track on each side for the wheels, forming two narrower furrows. As the animals very naturally avoid the intermediate ridges, we thus get two receptacles for water, with shoulders to prevent its running off the road; the consequence is a saturation which penetrates and softens the road, and thus we see these ruts and ridges remaining until the road is again mended, probably for a couple of years or more, the intermediate ridges being scarcely worn. So a most important duty is neglected, viz., that of watching the road occasionally after the gravel is spread, and raking the young or newly-formed ridges into the nascent furrows, thus causing the horses to feel for a new footing; and by repeating the operation some half-dozen times, getting an evenly-worn surface, rounded and highest in the middle, so that the water flows quickly to each side, thus leaving the road high and dry; the great point being to prevent water from stagnating on the surface.

Thus the road gains constantly in compactness and durability. A labourer with a common rake will regulate a long road at a very small cost. He should also be provided with a stone-hammer to break any large stones that will not bind, or that form bumps above the surfaces. These two important operations are almost invariably omitted in most parishes, and consequently much inconvenience and loss results. Again, as to the time of road-mending, I have been annoyed a whole year by a quantity of loose stones being shot down in dry March, and rolling about all summer, a portion of them finding their way into the adjoining ditches. So long as parish road-mending is left to the caprice or crotchets of local and annually changing surveyors, we can hardly expect much improvement, for ideas vary from brickbats to stones picked from the fields, the latter varying from the size of cricket-balls to that of eggs; and as there is no raking or breaking, but merely a shooting down, it is easy to imagine the uncomfortable consequences. This is a great financial mistake, which insidiously abstracts from the farmer's pocket, through the medium of surveyors' rates, breakages, broken knees, and waste of power, a sum much greater than that required by a more perfect management, such as we see on our great public roads. It is a common thing to elect as surveyor a farmer who won't spend money, and thus neglect soon results in evidence of false economy. After a heavy shower one can at once detect the weak places on a road. Little pools, having no means of escape except by soaking into and weakening the road, indicate the necessity for a few shovelsful of gravel. I have seen the very worst management where the road runs up and down hill. Here it is of the utmost importance that the crown of the road should be kept highest, and that the rapidly-gathering water should have means of escape into a ditch at intervals on the hill. Instead of this, and for want of a grating or two and pipes under the road, the rushing torrent roars down to the bottom of the hill, or down the middle of the hollow road, carrying with it into the ditches cartloads of gravel from the torn and furrowed road.

There is one very important matter that should be observed and particularly attended to. However well-made the road may be, grass will grow on its untrodden sides, and this grass has the power to raise the sides many inches in the course of a few years, and this is how it occurs: Fine grasses of the cereal tribe require much silica; this silica is prepared for them from the pounded and aerated surface of the road, and carried to them by the road-washings. Consequently these grasses multiply their roots to such an extent among the subterranean gravel that the quantity of vegetation thus formed forces up the earth or sides of the road, and causes a high ridge, where before none existed, thus preventing the escape of water and injuring the road. This grass should be annually removed before it takes too strong a hold of the ground.

The growth of these ridges, forced up by subterranean vegetation, suggests many reflections. Antiquaries may no longer wonder at finding the architecture of ancient nations many feet below the surface. Vegetation has forced the earth above them, or engulphed them. Place any substance on a good grass field and it will soon disappear; neglect your gravel walks for some years and they will become a miniature pasture, with the gravel some depth beneath. Buildings are said to settle down in course of time, but it is really active vegetation, aided by worms, that swallows them up. The sides of roads are particularly encouraging to the growth of fine grasses, because of the amount of available silica and alkalies, and particularly because the grass thus placed avails of a rainfall probably six times as great as ordinary grass, for all that falls on the bare road flows to the grass.

A practical farmer who visited me said he always manured his grass land with gravel from a pit, and it answered admirably. The gravel was soon "appropriated" by the grass, whose roots enveloped and embedded it.

Besides, there is always moisture under a stone in the hottest summer day, and thus the water is retained for the thirsty grass roots.

If you pull up a tiny plant of grass, growing in your gravel walk, after rains when the gravel is loose, you will be astonished to find what an immense bunch of roots it has in proportion to its surface growth, and how much fine grit it has appropriated and attached to those fibres. We can thus easily conclude what soils suit fine grasses. How soon a dressing of chalk lumps disappears from the surface, and in old grass pasture what a tangled web of fibrous roots arrest the rainfall, and appropriate much of it! It is this power of arresting surface-water that prevents the immediate action of drains or coarse water-grass pastures. But as these are gradually superseded by a better class of grasses (the seeds of which should be sown), drainage will act more perfectly.

To return to our roads. Let us hope that more counties will avail of the new Act, by which local mismanagement will give place to uniform and sensible action.

Tiptree, Nov. 5. J. J. MECHI.

P.S.—Where roads have been long neglected, it is a good plan to pick up and sift the sides and put the gravel in the middle of the road. A certain farmer, when surveyor, used to fill the centre or foot furrow with gravel, which caused the horses to shift their track; still there was no raking or levelling.

THE TENANTRY OF THE UNITED KINGDOM.

BY A PRACTICAL FARMER.

Mr. Bright, in his address to the deputation from the Cork Farmers' Club, at Dublin, said: "In England and Scotland the tenants are so powerful that if they once put their heads in one direction there is no possibility of withstanding them."......" If in England the tenantry, and in Scotland the tenant-farmers, the most capable, the most intelligent, the best agriculturists perhaps in the world—if they were to join in favour of measures, such as measures hostile to the game-laws, hostile to any injustice which is supposed to exist with regard to the improvement of tenants, it would be quite impossible for the Parliament to resist their demands." This coming from a man by no means too favourably disposed to aid the agricultural interest, is high testimony on behalf of the whole body of practical farmers, who do not know, and cannot be made to feel, their power and importance in the body politic, or their influence, if once generally exerted, in the Senate. The amount of agricultural property possessed by farmers, and particularly tenant farmers, is enormous. Take the last statistics of live farm stock and value them, *i. e.*, of cattle, 8,316,960, at £10 each, equal to £83,169,600; of sheep, 25,795,708, at 40s. each, equal to £51,591,416; of pigs, 3,802,399, at 40s. each, equal to £7,604,798; being a total of £142,365,814. Add for horses, estimated according to the latest returns at 2,030,015, at £15 each, equal to £30,450,750; of poultry of all kinds, estimated at 15,000,000, at 3s. each, equal to £2,250,000; making a grand total of £175,066,564 for live stock alone. Again, take the arable lands held by farmers, and estimate the value of their produce in accordance with the latest statistics with which we are favoured. This I put in tabular form—

	Acres.		£		£
Wheat	4,331,472	at	10,	equal to	43,314,720
Barley	3,006,701	at	10,	,,	30,067,010
Oats	3,939,043	at	8,	,,	31,512,344
Beans and Peas..	755,842	at	8,	,,	6,046,736
Bere and Rye ...	111,319	at	8,	,,	890,552
Flax	257,122	at	12,	,,	3,085,464
Hops..............	18,976	at	30,	,,	569,280
Fallow	920,962	at	3,	,,	2,762,886
Turnips...........	3,055,012	at	5,	,,	15,275,060
Mangolds.........	200,284	at	10,	,,	2,002,840
Carrots	40,830	at	15,	,,	612,450
Potatoes	1,382,525	at	15,	,,	19,737,875
Cabbage	107,990	at	10,	,,	1,079,900
Vetches...........	268,065	at	4,	,,	1,072,260
Clover, &c........	4,663,870	at	3,	,,	13,991,610
Pastures..........	14,000,000	at	3,	,,	42,000,000
Cattle, sheep, horses, pigs, &c. (brought down)					175,066,564
					£389,087,551

Add to this enormous sum an estimate for sundries, *i. e.*, agricultural implements, artificial foods on hand, artificial manures, tenant-right, and the like, connected with agriculture, to the amount of, say, £10,912,449, and we have the good round sum of £400,000,000 as the personal property of the farmers of the United Kingdom, to say nothing of the value of the fee simple of the land held by very many of them. This is a low estimate, no doubt; but I deal in round numbers, and I find ample margin for my purpose. Besides, it must be remembered that upwards of £200,000,000 of this estimate is the *annual* arable produce, and nearly the same amount is realized annually (for the business of a farm is nearly an annual one) by the breeding and fatting of live stock, &c., &c., although many heads of stock remain over. I therefore do not think it far beyond the mark at the present time (1866) to estimate *the annual agricultural produce of the United Kingdom at* 400,000,000 *of pounds sterling!* and for this wonderful annual production the country is principally indebted to the skill, energy, and industry of the tenantry of the United Kingdom; and, further, to realize this astounding amount, their expenditure in payments for labour alone, exclusive of farm servants, annually amount, according to reliable estimates of the occupations of the people, to no less a sum than £75,000,000; and this sum is paid to working-men for work done upon the farm. The total earnings of every class of working-men and women in the United Kingdom, including soldiers, police-servants, &c., &c., amount to about £418,300,000; of this sum the agricultural labourer receives the handsome quota as above of £75,000,000. Can anything show more forcibly the value and importance of the tenantry of the United Kingdom to the well-being of the community than this statement? Their productions as a contribution or share in promoting the general weal, their country's prosperity, is far beyond that of any other class; indeed, it nearly doubles the total amount produced by all other of the productive classes, which, according to Spackman, did not, in 1851, exceed £200,000,000. Having, I think, fairly shown, in the short summary given, that "the tenantry form a most important body in the country, I ask, what is their actual position and political *status?* Do they, as a body, take that high standing in the United Kingdom, or in the Senate, which their value and importance to the State indicate? Do they seek political influence, and exert themselves sufficiently to obtain it? Are they fairly represented in Parliament? Every reply must be a decided negative. Time was when the aristocracy and country gentlemen did represent them, or professed so to do, as considering their interests identical; but latterly "the landed interest" has either been too negligent, too easy and supine, or it has been overmatched or overpowered by the various interests connected with other branches of the Legislature. They have given in to party and to expediency; and "the tenantry" are the sufferers. They now have no exclusive advantages in the country's taxation as formerly—protection in reference to corn imports, for instance. Why, then, is their barley to be so heavily taxed when made into malt? Why are they to bear the chief maintenance of the Church, the county expenditure, the repairs of roads, the paupers of the country, at the same time bearing their full share in the general taxation? There are many matters of a legislative character connected intimately with their interests requiring close watchfulness and investigation—*i.e.*, tithe averages, county rates, corn returns, import of cattle regulations, agricultural statistics, game-laws, road reform, uniformity of weights and measures, &c., &c.; yes, and Parliamentary reform too, lest the landed interest should be wholly swamped. £400,000,000 a-year should have some weight in the Senate commensurate with its desirable and permanent prosperity. All these matters, according to Mr. Bright, are in the hands of "the tenantry." Why should they, then, not take their proper place? Why should they not send members to

Parliament from their own class? There are plenty of clever, well-educated, business-like tenant-farmers now to be found in every part of the country. Why not form combinations amongst "the tenantry," raise subscriptions, and endeavour to return them, *i.e.*, tenant-farmers, wherever a fair prospect presents itself, be it either in county or borough! Paid members are of course held somewhat at a discount, or to be in a humble position, by millionaires and aristocrats; but "the workman is worthy of his hire:" by all means remunerate in moderation the men who represent us. There is nothing discreditable in this on either side. The removal of the Malt-tax would be a very desirable object. The meat of the people is untaxed, so should its drink be free. Beer is the poor man's best-loved and necessary beverage: it ought to be untaxed. Besides, what an advantage it would confer upon inferior barley-growers! This is mainly a tenant's question. He desires an increased consumption of barley, and an enhancement of price for that of inferior growth, as no maltster will pay a heavy tax upon an inferior article. This is the great blot upon the page of every Chancellor's speech upon "the Budget." It is the crying sin of England's system of taxation. Every other necessary of life has been relieved from taxation to a great extent, or altogether; malt only is the unfortunate exception. Politicians say the tax cannot be spared. What say tenant-farmers? "We have nothing to do with that." We leave that to every successive Chancellor of the Exchequer, not one of whom would be long without a substitute if that tax was abolished. It is patent to all the world that the tenant-farmers of England, or rather the United Kingdom, are no longer the lowly, uninformed, and servile kind of men they were some fifty years since. There is not a class of men in the kingdom more improved during the past half-century, and who are more intelligent or more independent, than the main body of the yeomanry of this country, nor one which has done so much to add to a nation's wealth. They have truly "achieved greatness"; and as these are days when all classes are aiming to advance class-interests, each for their own class, it behoves them to do the same.

[The farmers of England will be slow to act upon the advice of Mr. Bright. One of the first principles of this "School" is that no class can improve its position until it joins the democratic movement; and we once heard a deputation of Midland Counties' men told as much, certainly to their no little astonishment.—EDITOR F. M.]

PROGRESS OF THE POTATO.

The potato holds its own at home and abroad, and the cultivation and consumption seem to be larger than ever. Exclusive of our home-growth, we imported nearly 807,000 cwts. from the Continent during last year; and the average imports of the past three years were 50,000 tons annually. Although in some former years the foreign imports were half as large again, the home production has probably extended. There is scarcely any doubt that the annual growth in Great Britain and Ireland equals what it was estimated at some fifteen years ago, namely, nine million tons.

Wherever the climate and soil are suitable, there the British settler carries with him and extends the culture of his favourite tuber. We find it in the southern African colonies, in parts of India, all over Australia, while in Tasmania and New Zealand it has long proved one of the most important crops. Even so far north on the great Australian continent as Queensland there are some five or six hundred acres already devoted to the potato. In the British North American colonies and Bermuda, potatoes are also much attended to. The Celestials have taken to its culture in the northern parts of China; and potatoes sell there at five shillings the hundredweight and a quarter.

In Ireland, the extent of land under potatoes still keeps large, and has averaged in the last ten years, with but slight fluctuations, 1,100,000 statute acres. The average yield has dropped-off, however, one-half from what it was; for, while in many past years it exceeded six and seven tons to the acre, it scarcely reaches one-half that amount now. In 1847, the average was seven and a-quarter tons per acre, and the produce two million tons; in 1849, at five and a-half tons per acre, the yield was four million tons; in 1855, at six and a-half tons, the produce was six and a-quarter million tons; in 1863, at three and a-half tons, the yield was three and a-half millions.

With a rapidly-increasing population in Australia, whose breadstuff wants are considerable, the demand for potatoes is yearly becoming larger. Potatoes, being next in importance to wheat as the food of man, are especially important in a mining colony like Victoria. The extent to which potato-cropping has been carried in Victoria for some years past indicates the intention of the colonists to adopt it as a standard crop; and, looking at the requirements of a mining population, they are right. As the climate of Victoria has been found to ripen the crop at three periods of the year, that circumstance suggests the feasibility of double-cropping the field in potato-rotation between its wheat-harvest and its barley-seeding.

It is curious to trace the progress of potato-culture in Port Phillip. In 1840, there were but 300 tons of potatoes raised; in the next year, this increased to 3,734 tons; and in 1844, to 12,500 tons. Last year, there were 28,000 acres under culture; but the average produce in the past ten years was three tons to the acre, showing that much remains to be done to increase the produce. The import of potatoes to Melbourne from the adjoining island of Tasmania is very large: in 1842, it was but 384 tons; in 1853, it was 9,000 tons, valued at £170,000; and now it has risen to very much larger proportions.

In 1864, one-fifth more land was planted with potatoes in South Australia than in the previous years; but the season proving very unfavourable, the quantity dug only exceeded that of the previous year by 224 tons: 2,963 acres were sown, yielding 6,493 tons, or 44 cwts. to the acre, being 11 cwts. below the previous year's average. This small acreage-yield contrasts strongly with England and Ireland. The importance of the potato in New Zealand we recently alluded to; and the very large yield per acre there, ranging from ten to twenty tons, will bear favourable comparison with any country, however high the cultivation.

In the United States, the produce of potatoes increased from 65¾ million bushels in 1850 to 110½ million bushels in 1860. Of this quantity, New York produced fully one-fourth, the next largest producing States being Pennsylvania, 12 million bushels; Ohio, 8¾ million bushels; Maine, 6½ million bushels; Vermont, Michigan, Illinois, New Jersey, and New Hampshire ranging from 4 to 5 million bushels. In the Southern States, sweet potatoes *(Batatas edulis)* are also grown to the amount of 42 million bushels annually. In our own North American Provinces the quantity grown is large. In 1860, three million bushels were raised, being an increase of fifty per cent. over 1855. In New Brunswick, 37,667 acres produced over four million bushels, valued at 2s. a bushel: in Nova Scotia, about the same quantity. In Upper Canada, the quantity of potatoes grown increased from five million bushels in 1856 to fifteen and a-half million bushels in 1861.

These several facts and figures may prove useful to those interested in potato-culture here and elsewhere; more especially as they are not generally accessible to the public, but are the results of close research in various official channels.

THE BIRMINGHAM POULTRY SHOW.

This was decidedly the best show that has ever been held under the auspices of our own or any other society. Descending from generalities to particulars, the coloured Dorking cocks exceeding one year old are an excellent collection; and to understand how good they are, we need only look at those which follow in the wake of the prize takers with mere commendations. Their juniors, with some exceptions, seem to lack size and substance. The hens are quite equal, if not superior, to their elder associates, Admiral Hornby's pen being worthy of his old renown. In respect to their subordinates, we may avow a preference for the Duke of Newcastle's third over the Rev. Mr. Hustler's second-prize pen. The pullets likewise command admiration, the Hon. Mrs. Arbuthnot's pair claiming a large measure of it for beauty of condition and plumage. Those of Mr. Fox are larger, but do not approach them in feather. These to our thinking constitute the cream of the Dorking classes, and this estimate is supported by the fact that nearly, if not quite, one-third of the pens are embraced in the awards. Of the silver grey Dorkings, the pullets are much the best, and the same may be said of the whites, which, we may add, are above the average of several recent years. No breed, however, is so well represented here as the Cochins, which appear to have regained all their former *prestige*. Indeed, we do not remember ever to have seen them in higher perfection than on the present occasion; and in proof of this we may refer to the unprecedented number of commendations by which the prizes are supplemented. The class for cocks above one year old is headed by Mr. Yardley and Mr. Tomlinson with birds which for size, form, or colour leave nothing to be desired. The younger birds muster in great force, and appear likely to support the credit of their race, Mr. Causer taking first honours with a very handsome bird only eight months old. The hens are exceedingly fine, many of the pens—more especially those of Messrs. Fell and Nelson—being models for imitation in regard to feather and plumage; but, taken *en masse*, the pullets do not rise to the same level. The brown and partridge-feathered varieties are much in advance of any which we have had for many seasons, Mr. Fenton's first-prize cock of the old birds being a noble specimen, and Colonel Ewart's young one very promising. The hens and pullets are both very good; and the whites must participate in the eulogiums we have passed upon the other classes, the judges pronouncing them the best assemblage which they had witnessed for some time. Bramah Pootras are uncommonly abundant, and the class of dark-coloured contains many large and symmetrical birds; but we thought the bulk of the light kind somewhat weedy. The dark-coloured hens and pullets, however, do not compare favourably with the light ones. The Malays are in the ascending scale both as to numbers and quality, while the large and robust-looking Creve Cœurs manifest the effects of the care bestowed upon them by their English patrons, and justify their growing popularity. The Spanish maintain their position; both cockerels and pullets eclipsing the old birds both in numbers and merit. The Hamburghs present the usual discrepancies. The black and silver-pencilled appear to be progressing, but the golden-pencilled and silver spangled are stationary, white ear lobes being too frequently absent among the hens of the latter variety, while the gold-spangled hens and pullets are sadly out of condition, and unworthy to mate with their *confrères*, which have better combs and ear lobes, and are richer in plumage than they formerly were. The Polish are more plentiful, and all three kinds have undergone a marked improvement. The Game Fowl have invariably been a leading feature of these shows, and they still retain their old supremacy. We believe, indeed, that those which are this year brought together have never been equalled. The competition in all the classes but the black and brassy-winged was very close, and the task of deciding upon the comparative merits of the candidates must have been a perplexing one. Where all is so excellent it is unnecessary to enter into detail, and we may therefore content ourselves with observing that some authorities look upon the brown-breasted reds as entitled to precedence, and that the judges considered Mr. Wood's silver-cup pullets to be the most perfect specimens they had ever seen. The class for other distinct varieties is well filled, and includes praiseworthy pens of La Flèche, Speckled Houdans, Cuckoo, Dorking, Andalusian, Buff Polish, Japanese, and Sultans, to which prizes are given. There is a marvellous display of Bantams of every kind. The game, of which there are many beautiful examples, predominate; but both the gold and silver laced are very good. The chief recommendations of the Turkeys, Geese, and Ducks are, of course, their qualifications for the table, and we consequently give the weight of the principal pens: First prize Aylesbury ducks, 18lbs.; second, 16½lbs.; third, 16¼lbs. First Rouen, 19lbs.; second, 18¼lbs.; third, 17¼lbs. White geese above one year old—first, 57¼lbs.: second, 47¼lbs.; ditto young birds, 42½lbs.; second, 40¼lbs.; third, 36¾lbs. Grey and mottled geese, above one year old—first, 59¼lbs.; second, 50¼lbs.: ditto, young birds—first, 42¾lbs.; second, 42¼lbs.; third, 39½lbs. Turkeys, above one year old—first, 49¾lbs.; second, 47¼lbs.; third, 46¼lbs.: ditto, young birds—first, 39¼lbs.; second, 36½lbs.; third, 35¼lbs. The exhibition of Pigeons is many degrees in advance of its predecessors, the number of entries being largely increased, and the generality of the birds being of more than ordinary merit. The blue Dragoons are of almost unique excellence; and the Almond Tumblers exceedingly good, while the Mottled Tumblers, the Pouters, in class 97, the Barbes, and the Owls of any other colour than blue or silver, all elicit from the judges encomiums which are appended to their awards. We may add that the first-prize Runts are the heaviest we have ever known, weighing 4lbs. 15oz., and that the second and third prize pens weigh 4lbs. 9oz. each.—*Midland Counties Herald.*

The receipts at the doors on Monday amounted to £214 10s., against £244 last year, and £258 7s. 6d. in 1864. The aggregate of the poultry sales was £901 16s., against £789 3s. 6d, in 1865; and £616 7s. 6d. in 1864. On Tuesday, the receipts for admission were £158 3s. 6d., against £234 2s. last year, and £329 16s. in 1864. Sales of poultry £214 16s., against £125 13s. 6d. last year, and £208 19s. in 1864. The company at the Dog Show has also been large.

THE GROWTH OF ROOTS AND CABBAGE.—At the Botley Club Meeting, Mr. W. Dickinson, of New Park, near Lymington, exhibited four cabbages 75 lbs., a cattle melon 93lbs., six mangolds 158lbs., six swedes 65 lbs., and six carrots 37lbs.; total 429lbs. Mr. Dickenson said, with regard to the growing of roots, his system had been to sow his land with salt, to plough and subsoil the land afterwards, and then to lay it up for the winter; and in the spring to give it a good dressing of farm-yard manure—3 cwt. of guano and 6 cwt. of salt—which, by the providence of God, had helped to produce the crops which they had seen. Some of the ground was so hard that the point of the pickaxe would not affect it, and they were obliged to blow it up with gunpowder before the drainer could get to work. They were compelled to underlay it with a subsoil of gravel and iron. Some of the pieces which were blown up by the gunpowder were so large as to be placed over the bunnies to enable the carts to pass over. He could tell them clearly and distinctly that his mangolds had weighed 50 tons an acre, and his carrots upwards of 20 tons. The cabbages he did not know, and the swedes were still under ground; but four tons had been taken up for Mr. Fletcher, of Southampton, and when the ground was measured, it was found that the yield had been at the rate of 20 tons an acre.

RUTLAND AGRICULTURAL SOCIETY.

The thirty-sixth anniversary of this society for the exhibition of horses, sheep, pigs, and poultry, was held at Oakham on Thursday, Nov. 22. The quality of the sheep exhibited was equal, if not superior, to that of previous years, and fully sustained the reputation the county of Rutland has gained in this way. Amongst the competitors in those classes were the Marquis of Exeter, Lord Gainsborough, Lord Berners, Colonel Lowther, Mr. C. J. Bradshaw, and Mr. W. Shipman, all of whom succeeded in carrying off prizes. Amongst the pigs were some extraordinary specimens of highly-fed animals, some of these being considered to far surpass any of the kind before seen at these shows. The principal attraction of the exhibition was the horses, of which there was a greater number of entries than in any previous year, especially in the hunting class.

The annual dinner was held in the Corn-exchange, as usual, and the chair was taken by G. H. Finch, Esq.

SHEEP.

To the exhibitor of the best three long-woolled fat wether sheep, one year old (open to All England), a silver cup or money, value £10, to Lord Berners, and £5 to Mr. C. J. Bradshaw. Colonel Lowther commended.

To the owner, being a tenant-farmer, of the three best long-woolled fat wether sheep, one year old, £10 to Mr. C. J. Bradshaw, and £5 to Mr. W. Shipman.

To the exhibitor of the best three short-woolled or short and long-woolled cross-bred fat wether sheep, one year old (open to All England), a silver cup or money, value £10, to Colonel Lowther, and £4 to the Earl of Gainsborough.

To the exhibitor of the best four long-woolled breeding ewes, £5 to Mr. C. J. Bradshaw, and £3 to Colonel Lowther.

To the exhibitor of the best four long-woolled theaves, one year old, £5 to Mr. C. J. Bradshaw, and £3 to Colonel Lowther. Mr. George Turner and Mr. W. Shipman commended.

To the exhibitor of the best four long-woolled wether lambs, £4 to Mr. W. Shipman, and £2 to Colonel Lowther. Mr. Charles Chapman commended.

To the exhibitor of the best four long-woolled ewe lambs, £4 to Mr. W. Shipman, and £2 to Colonel Lowther. Mr. Charles Chapman commended.

To the exhibitor of the best sheep shown as extra stock, a silver medal, value £3, to Mr. C. J. Bradshaw. Mr. W. Shipman highly commended.

PIGS.

To the exhibitor of the best fat pig, under 18 months old (open to All England), £5 to Mr. John Lynn, and £3 to Lord Berners. Mr. W. Carver highly commended. Mr. George Turner and Mr. R. C. Duckering commended.

To the exhibitor of the best fat pig, under 10 months old, not to exceed 30 stone live weight (open to All England), £5 to Mr. W. Carver, and £3 to Mr. John Lynn. Mr. George Turner commended.

To the tenant occupier of not more than thirty acres of land in the district for the best fat pig, of any weight, £2 to Mr. Ruddle, and £1 to Mr. C. Speed.

To the exhibitor of the best in-pigged or suckling sow or yelt, £3 to Mr. W. Carver.

HORSES.

To the exhibitor of the best mare for the general purposes of agriculture, £5 to Mr. T. Nicholson, of Barleythorpe. Mr. W. H. Wright, of Caldecott, highly commended.

To the exhibitor of the best two-year-old gelding or filly £3 to Mr. T. Stokes, of Caldecott. Mr. R. Wood, of Clapton, highly commended.

To the exhibitor, being a farmer, of the best four-year-old hunting mare or gelding, £25 to Mr. W. King, of North Luffenham, and £10 to Mr. W. Kirk, of Wymondham. Mr. H. Hunt, of Caldecott, commended.

To the exhibitor, being a farmer or tradesman, of the best half-bred hunting mare or gelding, under seven years old, £20 to Mr. W. Gilford, of North Luffenham, and £10 to Mr. W. Shipman, of Waltham. Mr. R. Ward, of Owston, commended.

To the exhibitor, being a tenant farmer or tradesman, of the best mare most adapted for breeding hunters, £7 to Mr. R. L. Healey, of Hambleton, and £3 to Mr. John Linney, of Thistleton. Mr. R. Healey, of Hambleton, and Mr. R. Hornsby commended.

To the exhibitor, being a tenant farmer or tradesman, of the best hackney mare or gelding, under seven years old, £10 to Mr. W. Fabling, of Burley, and £5 to Mr. Joseph Hind, of Ryhall Grange. Mr. Joseph Rawlings, of Oakham, commended.

For ponies under 7 years old, £3 to Mr. N. Walters, of Oakham, and a hunting whip to Mr. A. Guy, of Eaton. Mr. John Palethorpe, of Harlaxton, commended.

THE SUSSEX COUNTY SHOW.

The Christmas show of fat stock, poultry, roots, and implements, in connection with the County Association, formed at Brighton about five years ago, took place on Wednesday, Thursday, and Friday, Dec. 5, 6, and 7; but in consequence of the Orders in Council necessitating the absence of beasts, the exhibition was not marked with that success which has attended the previous efforts of the association. The carriage-shed, which the liberality of the Brighton Company has hitherto placed at the service of the society, not being available this year, the committee secured a piece of land between North-road and Church-street. The sheep were divided into two classes—wethers and ewes; and the animals shown would certainly have done credit to any exhibition in the country. In the class for wethers, Mr. H. H. Penfold, of Selsey, near Chichester, excelled with a pen of three choice animals, aged twenty-one months two weeks, which were bred by himself The competition for second prize resulted in favour of Mr· Henry Humphrey, of Ashington, whose sheep, twenty-one months old, were bred by the exhibitor. The executors of the late Mr. John Waters, of Motcomb, Eastbourne, were deservedly awarded the third prize; indeed, this pen ran Mr. Humphrey rather close. In the class for ewes, each of which had brought up a lamb, Mr. H. Humphrey, of Ashington, carried off the highest laurels with a pen of very fine animals, aged forty-five months, bred by himself, which were pronounced by competent judges to possess points of the highest merit in Southdown sheep. Mr. Arthur T. Newman, of Westdean, exhibited a pen of handsome sheep, aged fifty-seven months and two weeks, which were awarded the second prize. Scarcely less meritorious were the forty-five months sheep of the executors of the late Mr. Waters, who carried off the third prize in this class also. The judges must have considered the class to be generally good, because the only remaining pen, exhibited by Mr. Charles Hogben, of Shripney, Bognor, aged 56 months, received at their hands, and justly so, a high commendation. In the class allotted to pigs under six months old, there were two pens shown; but they were of very fine quality, and therefore both were awarded prizes—the first to Mr. Thomas Cooper, of Norton, Bishopstone, near Lewes, aged 5 months and 20 days; and the second to Mr. William Botting, of Westmeston-place, Hurst, aged four months. In the competition for pigs above six and under nine months old, three pens were entered, all of which were also awarded prizes. Mr. John Kent, of Goodwood, Chichester, carried the "crack" with a pen aged seven months and 21 days. The pen of Mr. Thomas Cooper, of Norton, carried off second honours, while the third prize fell to Mr. Thomas Saxby, of Firle, whose pigs were seven months and two days old. In class 12, for single pigs above nine and under 12 months old, the competition was rather larger, there being five entries. The 10 months old pig of Mr. W. Stanford, jun., of Charlton Court Farm, Steyning, was awarded first prize, it being an exceedingly choice animal. Mr. William Minter, of Firle, Lewes, took second prize for an animal aged 11 months and nine days, bred by Mr. Thomas Saxby. The Rev. George Pinnock, of Eastdean Vicarage, achieved the third prize with a pig aged ten months and eight days, bred by himself. The extra stock shown included two pens of Border Leicester sheep, one aged three years and eight months, and the other twenty months and three weeks, bred and exhibited by Mr. John Scott Dudgeon, of Pearcelands, Westhoathly; and a pen of five Sussex and Berkshire Pigs, bred and exhibited (not for competition) by Mr. Thomas Lester, of Rowlands, Lingfield, Surrey, aged nine months and ten days. The next feature of the show to which attention must be directed was the poultry, of which there was a most extensive and excellent collection. In some of the classes, especially for Dorkings and game fowls, the competition was very close, and the judges had great difficulty in coming to a decision, which they could only do after a most minute and careful inspection. The classes devoted to Aylesbury and Rouen ducks were well filled, and the birds shown were of great merit. There were also some fine geese and splendid turkeys. The Cochin-Chinas were not very strongly represented, but the birds were very bred. The pigeons, of which there was a numerous collection, deservedly attracted much attention. The show of roots was rather small.—*Sussex Express.*

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Wednesday, Dec. 5, 1866.—Present, Mr. H. S. Thompson, President, in the chair; the Earl of Powis, the Earl of Shrewsbury, Lord Chesham, Lord Tredegar, Lord Vernon, Lord Walsingham, Major-General the Hon. A. N. Hood, Sir Watkin W. Wynn, Bart., M.P., Mr. Barthropp, Mr. Cantrell, Colonel Challoner, Mr. Druce, Mr. Brandreth Gibbs, Mr. Hornsby, Mr. Jonas, Colonel Kingscote, M.P., Mr. Lawes, Mr. Milward, Mr. Pain, Mr. Randell, Mr. Read, M.P., Mr. Rigden, Mr. Torr, Mr. Wells, Major Wilson, Mr. Jacob Wilson, Mr. Frere, and Dr. Voelcker.

The following New Members were elected:

Allender, Henry James, 6, Belmont-road, Liverpool.
Chandler, W. B., Sutton, Woodbridge.
Clarke, John Algernon, Long Sutton.
Oakley, George, Greenhurst Park, Godstone.
Ward, F. W. The Lea Farm, Cleobury Mortimer, Salop.

FINANCES.—Major-General the Hon. A. N. Hood, chairman, presented the report, from which it appeared that the Secretary's receipts, during the past three months, had been duly examined by the Committee and by Messrs. Quilter, Ball, and Co., the Society's accountants, and found correct. The balance in the hands of the bankers on the 30th November was £1,110 13s. 8d. The Committee think it their duty to the Council to mention the fact that the present rate of expenditure exceeds the income, and beg to suggest that this subject may become one for future consideration. This report was adopted.

JOURNAL.—The President reported that the prize of £10 in Class VIII. Miscellaneous, "Experiments on the Potato Crop," had been awarded to the Essay bearing the superscription G. M. The Committee entertained some doubt whether these letters can be considered a *motto* as required by the conditions of competition; but as they have not been seen by either of the judges, it is thought sufficient to announce that, for the future, letters, whether the initials of the writer or not, will not be considered a motto, and essays bearing letters only as marks of distinction will be disqualified. The writer was ascertained to be George Maw, Esq., F.S.A., Benthall Hall, Broseley, Staffs.

CHEMICAL.—Mr. Wells reported, that Professor Voelcker delivered last season the following lectures: 1, on Disinfectants; 2, On the conditions to be observed in carrying out Agricultural Experiments in the Field.

Dr. Voelcker reported on the experiments which were made under his direction on different farms. In no instance the use of potash-salts for root crops was found beneficial, and in some cases crude potash-salts somewhat diminished the produce. He ascribes this to the cold and wet season, and the Committee suggest that the same experiments should be repeated for a succession of years, on light as well as on heavy land. The instructions for carrying out field experiments will be printed in the next volume of the Journal, and persons willing to undertake them are requested to communicate direct with Dr. Voelcker, who will gladly render every information and assistance in this desirable work, which, in order to be practically useful, should be taken in hand by as many as possible.

Dr. Voelcker contributed the following papers to the Society's Journal for 1866:—1, On Disinfectants and Experiments on Carbolic Acid; 2, On the Composition of Orange Globe Mangels—Bulbs and Tops; 3, Field Experiments on Clover-seeds; 4, first Report with Prof. Coleman on the Improvement of Grass-land on the Manor Farm, Braydon, Wilts.

Dr. Voelcker has in preparation for the next volume of the Journal—1, A Paper on the changes which take place in Grass and Clover during hay-making and in the stack; 2, A short Paper on Field Experiments with crude potash-salts and common salts on Mangels.

Dr. Voelcker reported that in a recent visit to Switzerland he found that irrigation with town sewage on meadow-land had been practised for more than 300 years in the immediate neighbourhood of Lausanne, and that the general experience there agreed well with that in England.

The following analyses were made by the consulting chemists for members of the Society:

Analysis made for Members of the Royal Agricultural Society of England in 1866.

Guanos	21
Superphosphates and similar artificial manures ...	92
Nitrate of soda and salts of ammonia	20
Refuse manures	27
Bone-dust	14
Limestone, marls, and other minerals	32
Soils	27
Waters	36
Oilcakes	51
Feeding meals and vegetable productions ...	13
Examination for poison	2
	335

This report was adopted.

House.—Major-Gen. the Hon. A. N. Hood reported that the certificate of the Registrar of Friendly Societies, with regard to the rating of the house, had been received. The builder's alterations in the house having been completed according to the contract, the balance due is now recommended to be paid, together with the architect's commission, amounting to £49 17s. This report was adopted.

Implements.—Colonel Challoner reported that the committee recommended that the words "including steam engines not qualified to compete for the above prizes" be added to the miscellaneous awards in the prize sheet.

Education.—The Earl of Powis reported that the Committee had followed out the scheme of prizes offered in the last Report, in connection with the Oxford Local Examinations, and had made the following award of prizes:—

List I.—*Prizes to Candidates who obtain Certificates, regard being had to their place in the General Class List.*

SENIORS.

Three in Oxford First Division.—A. Pollard, Liverpool Institute, £7; J. Lake, Alfred House Sc., Bow, Middlesex, £5; C. J. Langley, Abington House Sc., Northampton, £5.

Four in Oxford Second Division.—Thomas Hill, Grammar Sc., Wolverhampton, £2; H. T. Bovey, Clevedon Coll., Northampton, £2; C. O. Mackwood, Clarendon House, Kennington-road, £2; R. P. Rudd, Clarendon House, Kennington-road, £2.

JUNIORS.

Two in Oxford First Division.—W. H. Davies, Manchester Gr. School, £7; E. King, Abington House Sc., Northampton, £7.

Seven in Oxford Second Division.—F. Chubb, Mansion House Sc., Exeter, £3; G. B. Lovett, Ramsgate Coll. School, £3; C. A. Day, Clevedon Coll., Northampton, £1; C. Higham, Clevedon Coll., Northampton, £1; J. Luxton, Devon County School, £1; W. Mortimer, Devon County School, £1; J. C. Sargent, Abington House Sc., Northampton, £1.

List II.—*Prizes given to Candidates who, having passed the Preliminary Examination, are distinguished in any of the subjects mentioned in the R. A. S. E. Prize List.*

SENIORS.

C. J. Langley, Abington House Sc. (Mathematics), £5; A. Pollard, Liverpool Institute (Mathematics), £5; H. T. Bovey, Clevedon Coll. (Mathematics, £2; J. Lake, Alfred Ho. Sc., Bow (Mathematics), £2; R. P. Rudd. Clarendon House (Mathematics), £2; F. B. Kingdon, R. A. Coll., Cirencester (Chemistry), £5; A. Pollard, Liverpool Institute (Chemistry), £2; J. W. Sanders, Ullesthorpe House (Physiology), £5; A. Pollard, Liverpool Institute (Physiology), £2.

JUNIORS.

F. Chubb, Mansion Ho. Sc., Exeter (Pure Mathematics), £4; E. King, Abington Ho. Sc., Northampton (Pure Mathematics), £4; W. Mortimer, Devon County Sc. (Pure Mathematics), £4.

List III.—*Mechanics applied to Agriculture.*

F. B. Kingdon, Royal Agr. Coll., Cirencester, £5; H. R. Goddard, Royal Agr. Coll., Cirencester, £4; T. J. Elliott, Royal Agr. Coll., Cirencester, £3; J. L. Waldon, Devon County School, £3.

Chemistry applied to Agriculture.—F. B. Kingdon, Royal Agr. Coll., Cirencester, £5; J. L. Waldon, Devon County School, £4; H. R. Goddard, Royal Agr. Coll., Cirencester, £4.

In all these lists where prizes of the same value are given to more than one candidate for the same subject, the candidates' names are arranged in alphabetical order.

The whole number of candidates was 45. The number entered for the first Cambridge Examination in 1865 was 120.

Those entered at the first Oxford Examination in 1866 were 45. This apparent diminution arises from the fact that at first it was supposed that every agricultural candidate who passed the examination would receive some prize. The masters therefore entered all their agricultural pupils for Cambridge, but finding afterwards that the prizes were limited, entered for the Oxford Examinations only their best scholars.

Mr. Pinches, Hon. Sec. of the London district for the Oxford Examinations, informs our Hon. Sec. that the Prizes offered by the Society at the last Oxford Examination had not become sufficiently known, and that should the Society offer any prizes for the year 1867, he would be able to assist in distributing the notices.

With regard to the Cambridge Local Examinations to be held during the present month, the Council have determined upon offering the following prizes:

I. To Candidates who answer papers to be set in Mechanics and Chemistry as applied to Agriculture. Open to Seniors and Juniors who have passed the Preliminary Examination as above, and also to any young men not exceeding 25 years of age (duly recommended).
    Mechanics applied to Agriculture £10
    Chemistry applied to Agriculture £10
II. To Candidates who obtain certificates, regard being had to their place in the General Class List.
    Seniors, a 1st prize of £5
    Juniors, a 1st prize of £5
III. To Candidates who (having passed the Preliminary Examination) are distinguished in any of the following special subjects:

Seniors.

Section E. { Pure Mathematics, a 1st prize of ... £5
Section E. { Applied Mathematics, a 1st prize of ... £5
Section F. Chemistry, a 1st prize of £5
Section G. 1. Zoology, and the elements of Animal Physiology, a 1st prize of £5
2. Botany, and the elements of Vegetable Physiology, a 1st prize of £5
3. Geology, including Physical Geography, a 1st prize of £5

No student will be examined in more than one of these three divisions (1) (2) (3).

Juniors.

Section 7. Pure Mathematics, a 1st prize of ... £5
Section 8. Mechanics, a 1st prize of £5
Section 9. Chemistry, a 1st prize of £5
Section 10. { (*a*) Zoology, a 1st prize of £5
Section 10. { (*b*) Botany, a 1st prize of £5

No student will be examined in more than one of the two divisions (*a*) and (*b*).

A sum of £30 will be given away in secondary prizes of not less than £2 each, according to the discretion of the Committee.

Seventy-four candidates are entered for these prizes. Of these, twenty-one are seniors, and forty-five juniors; while ten are entered for the special prizes in mechanics and chemistry applied to agriculture, of whom two are also entered amongst the seniors.

The Council also offer (besides the foregoing prizes) one senior scholarship of £50, and four junior scholarships of £20, to be competed for at the ensuing Cambridge Local Examinations in December, 1866, limited to sons of tenant-farmers, or of owners, if not exceeding 500 acres, occupying their own land, on the following conditions:—

That the senior scholarship shall only be given on condition that the scholar spend a year with a practical agriculturist, to be approved by the Education Committee, or at one of the agricultural colleges, such as Cirencester, Glasnevin, or the Agricultural Department at Edinburgh, and that the money shall not be paid until a testimonial as to good conduct and industry be produced, at the end of the year of scholarship, from the body or person under whom the scholar has studied.

That the junior scholarships shall only be given upon condition that the scholars spend a year at a school to be approved by the Education Committee, and that the money shall not be paid until a testimonial as to good conduct and industry be produced at the end of the year of scholarship from the person under whom the scholars have studied.

These scholarships will be awarded according to the order in which the candidates stand at the Cambridge Local Examinations.

Seven candidates present themselves for the junior scholarships.

The Council have again obtained the assistance of Mr. Besant, of St. John's College, Cambridge (senior wrangler, 1850), to examine in mechanics applied to agriculture, in conjunction with Mr. Amos, the Society's consulting engineer; Mr. Liveing, professor of chemistry in the University of Cambridge; and Professor Voelcker, the Society's consulting chemist, will conduct the examination in chemistry applied to agriculture.

Bury St. Edmunds Meeting.—The Earl of Powis stated that the committee had accepted the offer by the local committee of prizes for plans for labourers' cottages, subject to Mr. Randell's suggestions, of which the local committee present approved. The local committee were requested to provide corn in the straw for trials; hay, straw, cabbages, clover, and other forage, as agreed on last year: the secretary to confer with Mr. Brandreth Gibbs, and send information as to the kind and quantities required. They recommended that the Society's surveyor go down forthwith to stake out the roads and approaches to the showyard, and that he submit a plan for a smaller size of boxes for ponies to the next meeting. This report was adopted.

Poultry Prizes.—Major-General the Hon. A. N. Hood having advocated the offer of a sum not exceeding £200 in prizes for Poultry at the Bury Show, the motion was seconded by Mr. Barthropp, and opposed by Mr. Torr and Mr. Milward. The motion was ultimately carried by 12 ayes to 5 noes; and a Committee, consisting of Major-General the Hon. A. N. Hood, Mr. Read, M.P., Mr. Barthropp, Mr. Cantrell, Mr. Druce, Mr. Brandreth Gibbs, and Major Wilson, was appointed to carry out the necessary arrangements.

Committee of Selection.—The President stated that the Committee recommend that Sir Edward Kerrison be elected a Vice-President, to fill the vacancy caused by the death of Mr. Fisher Hobbs, and take this opportunity of expressing their deep sense of the great services rendered by that gentleman to this Society from the time of its formation, and beg to suggest that a paragraph be inserted in the Report to the general meeting on Wednesday next, expressive of the great regret occasioned by his death to all his late colleagues on the Council.

Mr. D. R. Davies, of Mere Old Hall, Cheshire, having been proposed by Mr. Dent to fill the vacancy caused by the election of Mr. Jonas as Vice-President, and the Committee having ascertained that district C, in which Mr. Davies resides, contains 502 members of the Society, and is represented by only four members of Council, Mr. Davies is recommended by the Committee accordingly. As the names of the six elected members of the Committee have been so recently before the Council for election, it is proposed that they shall continue in office for the coming year, with the exception of Lord Vernon, who is going to the Continent, and Mr. Jacob Wilson, in consequence of his great distance from London, thus leaving two vacancies to be filled up by the Council.

On the nomination of Mr. Torr, seconded by Mr. Randell, Sir Edward Kerrison, Bart., M.P., was unanimously elected a Vice-President of the Society, in the room of the late Mr. Fisher Hobbs, whose loss was deeply felt by the Council; and Lord Walsingham took occasion to pronounce an eloquent eulogium upon the capacities for business and the straightforward, honourable character of Mr. Fisher Hobbs, who was always ready to give the Society his best advice and assistance.

The President, in the absence of Mr. Dent, M.P., proposed, and Mr. Milward seconded, Mr. D. R. Davies, of Mere Old Hall, Knutsford, Cheshire, as a Member of Council, in the room of Mr. Jonas, elected a Vice-President. Mr. Davies was elected unanimously.

Cattle-Plague.—Lord Walsingham reported that the Committee had drawn up a series of resolutions, as follows:

The points to which the Committee particularly wish to draw the attention of the Council are:—

1st. The importation of Foreign Cattle;
2nd. The re-opening of Fairs and Markets; and
3rd. The necessity of extending the time during which the powers granted to the Privy Council under the Acts of the last Session may be exercised.

With respect to the first point the Committee believe that the existing restrictions are probably sufficient for the present, but they think that unless they are made permanent, it will not be considered worth while to erect lairs for the purpose of carrying out regulations which may be only of a temporary nature, and that consequently such as relate to quarantine will become inoperative. The constant presence of the disease in various parts of the Continent of Europe makes it extremely probable that, except under very stringent regulations, the disease will frequently be re-imported; and they believe that it will eventually be found that nothing short of permanent regulations for killing animals intended for slaughter at the ports at which they are landed will prevent its introduction; and that with respect to store cattle, the regulations should be of such a permanent character, as will lead to the provision of such buildings as will be necessary for carrying out an efficient system of quarantine.

With respect to the second point adverted to by the Committee, they think considerable danger will be incurred by re-opening fairs and markets at the present time, except under the restriction of immediate slaughter. With reference to these and the remaining points submitted by the Committee, they recommend that a deputation be authorised by the Council to seek an interview with the Lord-President of the Privy Council, to represent their opinions on this subject, and to call the attention of the Government to the importance of obtaining, if necessary, parliamentary powers, so that the trade in cattle may be placed upon such a footing as may ensure the greatest amount of security to owners of cattle; and that, at the same time, the dealers and importers may know under what restrictions the trade is to be carried on, and be encouraged to provide such appliances as may enable them to conduct their business with the least possible inconvenience to themselves, and the smallest risk to and interference with public interests.

This report was adopted, and it was resolved that a deputation from the Society should wait on the Lord President of the Privy Council, at the Privy Council Office, on Friday the 7th inst., and impress on his Grace the above resolutions.

The Annual Reports of all the Standing Committees were presented by the respective Chairmen.

The Standing Committees for 1867—viz., Finance Committee, Journal Committee, Chemical Committee, House Committee, Implement Committee, Veterinary Committee, Stock-Prizes Committee, General Bury Committee, Show-yard Contracts Committee, and Education Committee were appointed.

The Live-Stock and Implement Prize Sheets for the Bury Meeting were settled at a Special Council, which met by order of the President at the rising of the Monthly Council.

DEPUTATION TO THE LORD-PRESIDENT OF THE COUNCIL.

On Friday afternoon, Dec. 7, a deputation of the Council of the Royal Agricultural Society of England, obtained an interview with the Duke of Buckingham, Lord-President of the Council, at the Privy Council Office, to submit the resolutions of the Council on the subject of the cattle trade to his Grace, and to elicit the views of the Government thereon.

The deputation was composed of Mr. H. S. Thompson (president), the Earl of Powis, Major-General the Hon. A. N. Hood, Mr. Cantrell, and Mr. H. Hall Dare, secretary.

The members of the deputation having been introduced to the Lord-President,

Mr. Thompson said the points to which the Council particularly desired to draw the attention of the Lords of the Privy Council were, first, the importation of foreign cattle; second, the re-opening of fairs and markets; and, third, the necessity of extending the time during which the powers granted to the Privy Council under the act of last session may be exercised. With respect to the first point the Council believed that the existing restrictions were probably sufficient for the present; but they thought that unless they are made permanent, it would not be considered worth while to erect lairs for the purpose of carrying out regulations which may be only of a temporary nature, and that consequently such as relate to quarantine will become inoperative. The constant presence of the disease in various parts of the Continent of Europe made it extremely probable that except under very stringent regulations the disease would frequently be re-imported, and they believed that it would eventually be found that nothing short of permanent regulations for killing animals intended for slaughter at the ports at which they are landed will prevent its introduction, and that with respect to store cattle, the regulations should be of such a permanent character as would lead to the provision of such buildings as would be necessary for carrying out an efficient system of quarantine. With respect to the second and third points adverted to by the Council, they thought considerable danger would be incurred 'by re-opening fairs and markets af the present time, except under the restrictions of immediate slaughter, and they begged leave to call the attention of the Government to the importance of obtaining, it necessary, additional parliamentary powers, so that the trade in cattle may be placed on such a footing as may ensure the greatest amount of security to owners of cattle, and that, at the same time, the dealers and importers may know under what restrictions the trade is to be carried on, and be encouraged to provide such appliances as may enable them to conduct their business with the least possible inconvenience to themselves, and the smallest risk to, and interference with, public interest. Mr. Thompson proceeded to enlarge on the resolutions of the Council. As to the importation of cattle, he thought that it was assuming more and more importance, and ought to be put on a permanent footing, for the sake of the large interest involved, and considering the new position in which that trade is placed by the opening of so many more railways across the country. The greater facilities of locomotion and the higher price of cattle, rendering a greater inducement to bring cattle from the various ports of arrival across country, made it so much the more necessary that every possible precaution should be taken to prevent the re-importation of the cattle-plague from time to time.

The Lord-President observed that at present there was no power existing to make permanent regulations for quarantine. With regard to the importation of cattle there was, however, in operation a temporary system of strict quarantine for not exceeding 28 days. It was probable that one large place for importation, Harwich, would be opened in the course of a few days.

A member of the deputation inquired what was to be the arrangement made with regard to store cattle at Harwich?

The Lord-President replied that formal plans had not been set down; but from the interviews they had had with the railway authorities, there seemed to be no difficulty in the way of an arrangement of the kind being carried out. The ground appeared to be well isolated, and the piers convenient for landing, the land itself being of considerable extent. There were at Harwich a certain number of sheds, and several acres of pasture-land, divided by salt-water creeks, the supply in which was never less than four feet of salt water at the lowest ebb. And the isolation was almost complete. There was a high sea embankment between the land and sea-shore, along which runs simply a footway, and the access was exceedingly difficult. The land on the other side was entirely isolated by the railway. In fact, the land was all the property of the railway company. It was proposed to make the northernmost pier a cattle-landing pier. There were two ranges of sheds immediately adjacent, and there would be slaughter-houses for slaughtering animals.

Major-General Hood thought it would be desirable for Government to take into consideration the number of ports which would thus be required to supply the wants of the country.

The Lord-President said probably one port would suffice. Harwich was the only port which had applied that, had sufficient area. It would not do to concede the same permission to a port where the pier was in the centre of the town. The regulations which were to apply to Harwich were now under discussion between the Privy Council and the Customs; and he had a rough draft of those proposed, though as yet unmatured, and which his Grace then read. By these, it was proposed to impose certain restrictions on the admission to the pens of imported cattle; also upon persons visiting the pens, no person except the owner being admitted, except by the permission of the officer in charge. No animals, carcases, or hides, were to be removed, except on a certificate from the inspector; and the pens, &c., were to be strewed with strong lime, or otherwise disinfected, every day. Then it was proposed that the pens should be placed entirely in charge of the Customs' officers, just the same as bonded warehouses; and they would appoint a person to take charge of the pens. It was further proposed that, on the inspector of quarantine certifying that the animals had remained there twenty-eight days without disease, his certificate should be equivalent to the order ordinarily given for the removal of stock.

The Earl of Powis asked how the proposed arrangement would apply to foreign or store cattle taken to the Metropolitan Market?

The Lord-President answered that all cattle imported would have to go under quarantine, or be immediately slaughtered. As regards the removal of fat animals, the views of the Government were that it would be extremely dangerous to permit it, except under the ordinary regulations.

Mr. Thompson expressed his belief that removals of cattle were to a large extent clandestinely carried on. He cited the cases of Wakefield and Rotherham, and said that at Rotherham there was a large number of cattle sold, not one-tenth of which was consumed there. And as to the case of Wakefield, a great deal of the cattle sold there was supplied to Leeds. Therefore it was very important this matter should be looked after. The Council of the Agricultural Society had thought it might be regulated sufficiently by the magistrates giving licences for the removal of uninfected animals from the fat-cattle market where they are first shown, and by the railway companies agreeing not to let animals go by their lines unless they had such magistrates' licence. They should then only be allowed to go one journey, and be slaughtered within a certain number of days.

The Lord-President said the Government had had memorials from Brighton, Aberdeen, and other places, on the subject, and there seemed to be a difficulty as to the distance animals might be removed under one licence. It was well known there had been cases where cattle had left the metropolitan markets and gone down into the country.

Major-General Hood remarked that the opinion generally among agriculturists seemed to be that wherever fat cattle are taken there they ought to be killed. He thought, if the present restrictions were kept, say for another three months, until the plague is quite gone, then they should be entirely free to act; but if the restrictions, were relaxed, the disease might again spread, and the horrors of the plague be repeated.

The Lord-President said, with regard to the second point, the re-opening of fairs and markets, that was a question of time, and must be regulated by the degree of danger. They were re-opened in Scotland.

Major-General Hood observed they were freer in Scotland from the disease than we are in England, and had been fortunately so for a greater length of time.

The LORD-PRESIDENT said the markets in Scotland were re-opened within a month of the last case of plague, and no ill consequences had resulted, there having been no reappearance of the disease.

A member of the deputation having alluded to a difference between the metropolitan and suburban markets,

The LORD-PRESIDENT said it appeared to the Government that the greatest danger existed from the unauthorised sales which were known to be carried on. It was a practice for a large number of cattle to be got together on a piece of private ground outside the boundaries of the boroughs in which markets are closed, and to carry on illicit sales there.

Mr. THOMPSON confirmed his Grace's remarks by citing an instance in which that had been done in Yorkshire.

The LORD-PRESIDENT proceeded to say that under those circumstances the Government had had to consider whether there was not a greater danger under the system of unauthorised sales (which there was great difficulty in preventing), under which they had no check upon the removal of animals, than under a system where markets are opened and regularly licenced. The question was whether markets under the restrictions of licences carefully examined and recorded were not safer than the practice of unauthorised sales. His Grace then inquired of the Deputation, as representing the agricultural interest, how they would supply dairy cows for large towns?

Major-General HOOD remarked they had already the power of removing cows; but he cited an instance in which, on his sending a cow into Hertfordshire, when it got to London the authorities declined to let it go any farther.

The LORD-PRESIDENT observed that, unless cows were allowed to be brought to London without being killed, the dairyman's business would be materially interfered with. Then, with regard to the markets, the deputation did not indicate any time that they desired them to be kept closed. As he understood, the opinion of the Royal Society was that all the markets for store cattle should be kept closed. Did they apprehend any great danger from animals imported under strict quarantine?

Mr. THOMPSON replied negatively, provided there continued the same machinery as now in operation.

The LORD-PRESIDENT said there was one point of deep moment which had been lost sight of. It was a fact that a great number of the inspectors had been paid off or reduced by the local authorities, although the disease might at any moment break out again. In fact, this had occured recently in two cases, in the East Riding. They had learned this from a private source. And, through the cause of which he had complained, the Government had no official report of the outbreak until yesterday, nor of the place having been declared infected. He did not see why the local authorities should thus dispose of their inspectors. For the Government was acting upon the assumption that if every possible care is not taken, the disease may break out again and spread. In Scotland, although the country was free from the plague, the same precautionary measures were taken, and all the machinery remained in force. But in England, the Government were aware that a very large number of inspectors had been dismissed altogether. In several districts there was no inspector to be found for 12 or 20 miles, and in one county they were entirely without an inspector.

A member of the deputation suggested whether it would not be well for Government to issue a notice calling the attention of the local authorities to the inexpediency of discharging or reducing the number of inspectors?

The LORD-PRESIDENT replied that the Government had already done that, and it rested with the country to second the efforts of the Government to free the land from this terrible scourge. The consequence of neglecting the inspectors might be very serious. The disease might again spread, and the expense to the local authorities of maintaining the system of inspection would be as nothing compared with that which would result from a return of the plague.

After some remarks from the deputation,

The Duke of BUCKINGHAM observed, it should be stated that the Government had not intended to grant any licence for the opening of any market where imported cattle would be received.

The deputation having thanked the Lord-President for the courtesy and consideration which he had manifested, the interview ended, having lasted only half an hour.

The Annual Meeting of this Society was held on the Wednesday in the Smithfield Show week, in Hanover-square, the President, Mr. H. S. Thompson, occupying the chair. The attendance was very large, considerably exceeding that at any previous meeting for some time past.

The SECRETARY, Mr. Hall Dare, read the following report of the Council:

REPORT OF THE COUNCIL.

During the last half year 6 governors and 114 members have died, while 1 governor and 32 members have been elected, so that the list now comprises

76	life governors
82	annual governors
1,380	life members
3,972	annual members
15	honorary members

making a total of 5,525.

The Council have elected Sir Edward Kerrison, Bart., M.P., and Mr. Jonas to supply the vacancies in the class of Vice-Presidents caused by the decease of Mr. Thomas Raymond Barker and Mr. Fisher Hobbs. In filling these vacancies the Council avail themselves of the opportunity of recording on their minutes an expression of their sincere regret at these losses, and their deep sense of the valuable services which these gentlemen had uniformly and unwearily rendered to the society.

Major Wilson, of Stowlangtoft Hall, Bury St. Edmunds, has been elected a member of Council in the room of Mr. Hamond, resigned; Sir Henry Vane, Bart., of Hutton Hall, Penrith, in the room of Mr. Wilson, deceased; and Mr. D. R. Davies, of Mere Old Hall, Knutsford, Cheshire, in the room of Mr. Jonas, elected a vice-president.

The statement of accounts for the half-year ended 30th June has been examined and approved by the society's auditors and accountants, and has been furnished to all members in the last number of the Journal.

The funded capital has been reduced by the sale of £1,000 Stock, and now stands at £18,027 19s. 6d. in the New Three per Cents. This sale has been rendered necessary partly by the cost of the addition of a new storey to the society's house, which materially adds to the value of the premises; and partly by the appropriation of a considerable sum to a thorough investigation into the results of the cultivation of the soil by steam-driven machinery in various parts of the country. To this latter object the Council determined to devote a sum not exceeding £1,000, and, notwithstanding the wet autumn, considerable progress has been made in the inquiry, the result of which will be fully made known in the first number of the Journal for next year.

The implements for which prizes will be given in the ensuing year consist of fixed and portable steam engines, fixed and portable thrashing machines, finishing machines, hand dressing machines, barley hummellers, chaff cutters, mills, crushers, oilcake breakers, bone mills, turnip cutters, and field gates; and as a period of four years will have elapsed since the trial of some of these classes of implements, it is to be anticipated that many improvements will be exhibited at Bury St. Edmunds.

The country meeting next year will be held in the week commencing Monday the 15th of July. Prizes to the amount of £2,925 are offered by the Society for live stock, and £430 for implements, while £570 are added by the Suffolk Agricultural Society and the Local Committee. It is also proposed to offer £200 in prizes for poultry, the eastern counties having long been famous for their success in this department.

The Education Committee have followed out the scheme of prizes offered in the last report in connection with the Oxford local examinations, and have made the following award of prizes:—

LIST I.—*Prizes to Candidates who obtain Certificates, regard being had to their place in the General Class List.*

SENIORS. Three in Oxford First Division.

NAME.	SCHOOL.	PRIZE.
A. Pollard	Liverpool Institute	£7
J. Lake	Alfred House School, Bow, Middlesex	5
C. J. Langley	Abington House School, Northampton	5
	Four in Oxford Second Division.	
Thomas Hill	Grammar School, Wolverhampton ...	£2
H. T. Bovey	Clevedon College, Northampton ...	2
C. O. Mackwood...	Clarendon House, Kennington Road	2
R. P Rudd	" "	2

JUNIORS. Two in Oxford First Division.

W. H. Davis ...	Manchester Grammar School	£7
E. King	Abington House School, Northampton	7

Seven in Oxford Second Division.

F. Chubb	Mansion House School, Exeter ...	£3
G. B. Lovett	Ramsgate College School	3
C. A. Day	Cleveden College, Northampton ...	1
C. Higham	" "	1
J. Luxton	Devon County School	1
W. Mortimer	" "	
J. C. Sargent	Abington House School, Northampton	1

LIST II.—*Prizes given to Candidates who, having passed the Preliminary Examination, are distinguished in any of the subjects mentioned in the R. A. S. E. Prize List.*

SENIORS.

Mathematics—

C. J. Langley......	Abington House School	£5
A. Pollard	Liverpool Institute	5
H. T. Bovey	Clevedon College	2
J. Lake	Alfred House School, Bow	2
R. P. Rudd.........	Clarendon House	2

Chemistry—

F. B. Kingdon ...	Royal Agric. College, Cirencester ...	£5
A. Pollard	Liverpool Institute	2

Physiology—

J. W. Sanders......	Ullesthorpe House	£5
A. Pollard	Liverpool Institute	2

JUNIORS.

Pure Mathematics—

F. Chubb	Mansion House School, Exeter ...	£4
E. King	Abington House, Northampton ...	4
W. Mortimer	Devon County School...	4

LIST III.—*Mechanics applied to Agriculture.*

F. B. Kingdon	Royal Agric. College, Cirencester ...	£5
H. R. Goddard	" " ...	4
T. J. Elliott	" " ...	3
J. L. Waldon	Devon County School...	3

Chemistry applied to Agriculture.

F. B. Kingdon	Royal Agric. College, Cirencester ...	£5
H. R. Goddard	Royal Agric. College, Cirencester ...	4
J. L. Waldon	Devon County School...	4

In all these lists where prizes of the same value are given to more than one candidate for the same subject, the candidates' names are arranged in alphabetical order.

The whole number of candidates was 45.

With regard to the Cambridge Local Examinations to be held during the present month, the Council have determined upon offering prizes for the same subjects as before.

Seventy-four candidates are entered for these prizes. Of these, 21 are Seniors and 45 Juniors: while 10 are entered for the special prizes in Mechanics and Chemistry applied to Agriculture, of whom 2 are also entered amongst the Seniors.

The Council also offer (besides the foregoing prizes) 1 Senior Scholarship of £50, and 4 Junior Scholarships of £20, to be competed for at the ensuing Cambridge Local Examinations in December, 1866, limited to sons of tenant-farmers, or of owners, if not exceeding 500 acres, occupying their own land, on the following conditions:—

> That the Senior Scholarship shall only be given on condition that the scholar spend a year with a practical agriculturist, to be approved by the Education Committee, or at one of the Agricultural Colleges—such as Cirencester, Glasnevin, or the Agricultural Department at Edinburgh—and that the money shall not be paid until a testimonial as to good conduct and industry be produced, at the end of the year of scholarship, from the body or person under whom the scholar has studied.
>
> That the Junior Scholarships shall only be given upon condition that the scholars spend a year at a school to be approved by the Education Committee, and that the money shall not be paid until a testimonial as to good conduct and industry be produced at the end of the year of scholarship, from the person under whom the scholars have studied.

These Scholarships will be awarded according to the order in which the candidates stand at the Cambridge Local Examinations.

The Council have again obtained the assistance of Mr. Besant, of St. John's College, Cambridge (Senior Wrangler 1850), to examine in Mechanics applied to Agriculture, in conjunction with Mr. Amos, the Society's consulting Engineer. Mr. Lieving, Professor of Chemistry in the University of Cambridge, and Professor Voelcker, the Society's Consulting Chemist, will conduct the examination in chemistry applied to agriculture.

While heartily uniting with the whole kingdom in the thanksgiving for the abatement of the Cattle Plague, the Council are at the same time sensible of the importance of continuing many of the existing restrictions on the traffic in live stock, and with this view have instructed a deputation to wait on the Lords of the Privy Council to draw their attention to the following points:

1st. The importation of foreign cattle.

2nd. The re-opening of fairs and markets; and

3rd. The necessity of extending the time during which the powers granted to the Privy Council under the Acts of the last Session may be exercised.

With respect to the first point the Council believe that the existing restrictions are probably sufficient for the present, but that unless they are made permanent it will not be considered worth while to erect lairs for the purpose of carrying out regulations which may be only of a temporary nature, and that consequently such as relate to quarantine will become inoperative. The constant presence of the disease in various art s of the Continent of Europe makes it extremely probable that except under very stringent regulations the disease will frequently be re-imported, and they believe that it will eventually be found that nothing short of permanent regulations for killing animals intended for slaughter at the ports at which they are landed will prevent its introduction, and that with respect to store cattle the regulations should be of such a permanent character as will lead to the provision of suitable buildings for carrying out an efficient system of quarantine.

With respect to the second and third points adverted to by the Council, they think considerable danger will be incurred by re-opening fairs and markets at the present time, except under the restrictions of immediate slaughter, and they wish to call the attention of the Government to the importance of obtaining, if necessary, additional Parliamentary powers, so that the trade in cattle may be placed upon such a footing as may ensure the greatest amount of security to owners of cattle, and that at the same time the dealers and importers may know under what restrictions the trade is to be carried on, and be encouraged to provide such appliances as may enable them to conduct their business with the least possible inconvenience to themselves, and the smallest risk to, and interference with, public interests.

By order of the Council,

H. HALL DARE, Secretary.

On the motion of Mr. Caldwell, seconded by Mr. Ellman, the report was unanimously adopted.

The CHAIRMAN then said: I now proceed, gentlemen, to read a short address, which at the request of the Council I have prepared, and I may observe that one reason why it is a written address is that it contains figures and statements with which I could not trust my memory. He then proceeded to read as follows:—The Royal Agricultural Society not having held a country meeting this year, the Council lost their customary opportunity of meeting the members of the society, and of manifesting, by the success of their show, both the vitality of the society and the steady progress of British agriculture. I therefore take this opportunity of making a few remarks on some of the topics which possess most interest for agriculturists at the present time, in the hope that other gentlemen may join in the discussion, and give the meeting the benefit of their experience and their opinions on those subjects. I wish first to mention that I shall only advert to those topics which possess a common interest for all our members, and shall avoid all such as may be likely to rouse feelings of antagonism and class interests (Hear, hear). I press this point strongly, because some of these forbidden topics involve questions of great importance, and, as chairman of the Journal Committee, I have frequently been urged to take steps to procure articles on such questions as leases, tenant right, preservation of game, &c. These and other similar questions are, no doubt, deeply interesting to both landlords and tenants, and nothing can be more reasonable than that men who have a common interest in any subjects of this nature should meet and discuss them—should, if they think fit, write pamphlets and newspaper articles, and endeavour as much as possible to enlist public opinion in support of their particular views; but when all is done, landlord and tenant must in the future, as in the past, settle their mutual rights and privileges by individual negotiation and agreement; and in the great majority of cases such negotiations will assuredly end in land being let at its market value, such market value varying in some measure according to the security afforded to the tenant, that if he lays out his capital on land that is not his own he will get it back with fair profit (Hear, hear). Whilst, however, admitting the full importance of this class of subjects, I do not hesitate to state that the consideration and discussion of them were not the objects with which this society was founded. I am one of those who took an active though a very subordinate part in its formation, and have been a member of the Council from that time to this, and I can safely say that the principal aim of the founders was to promote the improvement and development of those two great branches of industry known as stock and crop farming, upon which the prosperity of both landlords and tenants must ultimately depend, and in the prosecution of which landlords and tenants can heartily pull together (Hear, hear). I must here guard myself against the supposition that I mean to exclude from the list of subjects properly occupying the attention of this society such questions as the education of the agricultural classes, the best construction of labourers' cottages, and many other kindred subjects. Nothing can be farther from my intention. These subjects were set forth in our charter, and naturally and properly occupy the attention of the society at the present moment; but improvements of all kinds, whether in education, or in farm buildings and cottages, require ample means; and I repeat, therefore, that the first great object of the formation of this society was to increase as much as possible the amount of wealth to be extracted from the soil, leaving the apportionment of it between landlords, tenants, and labourers, to be settled between man and man at fitting time and place (Hear, hear). Nor is the sphere of our operations thus defined either a narrow or an ignoble one. We may well be content to devote our energies to the production of the great staple products which must always form the principal bulk of the food of man, and to produce this food in greater quantity and of better quality than heretofore is one of those highly gratifying results which, whilst improving the position of the agriculturist himself, adds at the same time to the comfort and wellbeing of even the humblest classes of his countrymen (Hear, hear). Having thus limited myself at the outset, I will first advert to that subject which has been one of absorbing interest during the whole of the past year—I mean the cattle plague. At this time last year the Council of this Society were exerting themselves to bring the collective weight of this and other leading agricultural societies to bear in inducing the Government to adopt certain stringent regulations for preventing the movement of cattle generally, and for killing promptly those attacked by the disease. The resolutions unanimously adopted by the Council with this view were, as nearly as may be, subsequently embodied in the Cattle Disease Prevention Act; and, looking at the immediate check given to the cattle plague when that Act came into force, and its subsequent rapid and continuous decline, few persons are now found to question the soundness of the policy then pursued. The cattle plague has now for a considerable period been brought into such narrow compass that we may reasonably hope soon to see it altogether extinguished; and it seems to me important that, whilst its disastrous effects are still fresh in our memories, we should not allow our attention to be diverted from the true character and results of this calamity until such regulations be permanently adopted—be made, in fact, part of the law of the land—as may give us all the security against its recurrence which the nature of the case will admit of (Hear, hear). The late attack of rinderpest may be said to have lasted little more than a year; for though the first cases were observed at the end of June, 1865, it had not made very great progress before August of that year, and by the end of August, 1866, the attack of the disease had been reduced within very narrow limits. In point of duration, therefore, the great visitation of rinderpest of the last century, which lasted from June, 1744 to 1757, or thereabouts, varied materially from this. But rinderpest, like other things, travels by railway in these days, and in little more than three months from its first appearance it had invaded more than half the counties of England and a large portion of Scotland. The number of diseased animals which have died or been killed amounted, on the 24th of November last, to 209,332. No return of their value can yet be obtained, but taking the average value of 1864 head slaughtered in the West Riding of Yorkshire, and applying that average to the whole number, we obtain a total of £2,690,000. This, however, does not represent the whole of our loss, as a considerable number died before the passing of the Cattle Disease Prevention Act, whose deaths were not reported to the inspectors. Heavy losses were also incurred by the forced sales and premature slaughter of young animals in store condition, in consequence of the panic caused whenever the disease made its first appearance in a new neighbourhood. On the whole I cannot rate the national loss caused by the cattle-plague at less than three millions sterling. It is mortifying to reflect that (humanly speaking) this great loss might have been in great measure prevented if we had not been too proud to profit by the experience of our own and other nations who had frequently to battle with this terrible scourge, and who had uniformly come to the conclusion, after repeated attempts at cure, that immediate isolation and slaughter of all animals attacked by rinderpest was the only mode of escaping heavy loss. No doubt some will be found to dissent from my conviction that this great loss might have been almost entirely prevented if our existing machinery for stamping out cattle-plague had been set to work on its first outbreak. It will be difficult, however, to escape from this conclusion if we compare the results of the "laissez aller" and the "stamping out" methods in the summers of 1865 and 1866. Compare, for instance, the month of July, 1865, with the month of September, 1866. In the former month there were 79 fresh outbreaks of the disease; in the latter there were 74. So that the number of new centres of infection created were in each of these months nearly the same. In the latter case, however, the stamping-out principle was applied to these new sources of infection, in the other they were left to increase and multiply. And what was the consequence? Two months later the full effect of these new outbreaks would be fully seen; and we find in September, 1865, 954 fresh outbreaks attacking 5,200 animals: whilst in November, 1866, there were only 8 fresh outbreaks attacking 16 animals. Why should not the 74 fresh outbreaks in September, 1866, have done as much mischief proportionately as the 79 in July, 1865? Some will say that the disease was worn out, had become less intense or less contagious than it was a year before. This, however, is not the case, as throughout the whole of this visitation the nature and character of the attacks have been remarkably uniform, and in the very latest cases, the disease has shown itself just as contagious and just as fatal as at the first commencement. I have already shown that we, as a nation, have incurred a very heavy loss rather than admit that our scientific means and appliances are as insufficient now to cure or even mitigate this disease as they were a century ago, in this country, or as they are in other countries up to the present day; but having paid so dearly for our experience, it would be totally inconsistent with the business-like and practical character of Englishmen if we did not take steps to profit by our past error, and to prevent our having to buy our experience over again at the same heavy cost (Hear, hear). With this view the Council have within the last few days sought an interview with her Majesty's Government, and we stated our unanimous conviction that so far as the present attack of rinderpest is concerned, it would be highly impolitic to relax the restrictions which have proved so effective until a sufficient time shall have elapsed without the occurrence of a single case to afford a reasonable probability that the disease is extinct in Great Britain. With reference to the future we also pointed out the importance of obtaining from Parliament, in a permanent form, the power to revive at any time when required the existing machinery. That this machinery is efficient for its purpose, is proved by the fact that in any of the later outbreaks the disease has rarely extended beyond the farms where it first appeared, unless from great apathy and negligence on the part of the local authorities. If the provisions of the Cattle Diseases Prevention Act are not renewed, they will expire next June, or at the end of the then session of Parliament; and, on any new outbreak of the disease, Parliament would have to be called together, or, if then sitting, the tedious process of passing a bill through both Houses would have to be incurred before any effective measures could be taken, and we should assuredly have again to pay dearly for our want of foresight. The third point—which the Council consider of equal, if not greater, importance than either of the two former—is that the importation of foreign cattle should be permanently placed on a safe footing (Hear, hear). The whole character of this trade has been changed by the continued extension of railways on the Continent of Europe, occurring as it has done simultaneously with a great increase in the price of cattle in the English markets. These two causes combined make it answer to the importer to bring cattle from much greater distances; and we can no longer consider Rotterdam and Hamburgh as the ports from which only Dutch or North German stock are brought here, but they have become the termini of a great network of railways, at the other end of which lie the great steppes of Eastern Europe, from which the rinderpest is rarely absent; and we are placed in nearly as much danger as countries like Austria and Prussia, which, geographically, lie much nearer to the sources of infection, and which have only kept themselves free from the most calamitous losses since they have adopted very stringent regulations as part of their permanent code, ready to be put into active operation at the shortest possible notice. The supplies of store cattle imported are so limited in number that it would not be difficult to establish an efficient system of quarantine for them; and there can be little doubt but that, if it were once thoroughly understood that in future all fat cattle must be slaughtered at the ports of disembarkation, arrangements would soon be made by which it could conveniently be carried out; and I am sanguine enough to believe that, after a time, it would be conducive to the interest of the importer, as it assuredly would be to that of the consumer. Let it be assumed that convenient slaughter-houses were constructed at the ports both of export and import. In winter, when the passage is rough and tedious, and the importers suffer great losses by general deterioration and numerous deaths amongst their live cargoes, they would slaughter the cattle at Rotterdam, Antwerp, Ostend, and other convenient ports; and during the winter months the meat could be brought over in capital condition. During the summer months, when fresh meat would not bear a sea-voyage, the animals must be brought over alive; but at that time of year the passage loses half its terrors, and the cattle would be slaughtered at Hull, Harwich, or the port of London. Even now, fresh meat is becoming an article of daily importation; and from a return kindly furnished to me by the President of the Board of Trade, I learn that in the month of October last no less than three millions four hundred and twenty-eight thousand pounds of meat, salted and fresh, were imported, of which the greater portion was fresh mutton (Hear, hear). The next question to which I shall allude is what has been termed the labour difficulty. All who are engaged in rural pursuits are aware that wages have risen very much during the last few years, and that not only has labour become a more costly item in farm expenditure, but it is extremely difficult in many districts to obtain a sufficiency of the right sort of men. Some years ago it was very common to hear farmers severely blamed for not giving high enough wages to their labourers, and now it is equally common to hear the labourers found fault with for asking extravagantly high wages. In each case the complaints are equally unreasonable. A farmer who should from kindness of heart give much higher wages than his neighbours would soon find himself in the *Gazette*, and it would be equally unbusiness-like to expect that labourers should ask lower wages than they think they can obtain. Several causes have contributed to bring about the present scarcity of labour in particular districts—the rapid expansion of trade, the successive alterations which have been made in the laws of parochial settlement, and, above all, the great increase in the facilities and cheapness of locomotion (Hear, hear). The change is, therefore, likely to be permanent, and it is an interesting question how best to deal with it. A noble lord at an agricultural dinner in one of the midland counties, a few months ago, was so much impressed with the importance of the question as to suggest the possibility of applying the co-operative system to agricultural labour. Judging from the newspaper report of his lordship's speech, he did not do more than throw out the idea with the view of eliciting discussion. It does not appear to me that the labourer could be made a sharer in the farmer's profits in good seasons unless he could also bear his share of the farmer's losses in bad ones, which he would clearly be unable to do (Hear, hear); but there is one mode in which the farmer might admit his labourers to be partners in his farm, which would, I think, go some way towards surmounting the present labour difficulty, and would, with little cost to the farmer, be of incalculable benefit to the labourer. The plan I would suggest is that the farmer should let to a certain number of his labourers sufficient grass land to enable each of them to keep a cow, and that these allotments should be the rewards of industry and sobriety. I have for some years watched the operation of two modes of carrying this out, one plan being to let each man a separate field of two or three acres, which is much preferred by the men; the other being to devote two fields of considerable size to a number of men, who use one in common as a summer pasture for their cows, and mow the other for hay, the separate holdings being marked out by a post at each corner. The latter method is suitable for large farms on which it might be difficult to find, or to form a sufficiency of small fields for separate allotment. Both plans work well. The cost to the farmer is trifling, as the cottagers are always willing to pay a fair rent for the land. To labourers with families the advantage of keeping a cow can hardly be overrated; but I do not think it advisable to confine it to fathers of families, as a steady married man without children is thus enabled to save a little money, and become so much interested in his cow and his pig that the alehouse is no longer the chief source of attraction during his leisure hours. Those who are best acquainted with agricultural labourers will, I feel confident, bear me out in the assertion that a man who can ensure regular work, at fair wages, with sufficient land to keep a cow and a pig, and obtain even a moderately-good cottage among the friends and neighbours whom he has known from his childhood, will seldom be found willing to exchange his position for the crowded courts and alleys of the large towns, even by the temptation of considerably higher money wages. The Council have, during this year, devoted a good deal of time and attention to the organization of a critical inquiry into the results of steam cultivation, followed up by an examination of selected farms in most of the counties of England. The high price of mutton and wool for several years has given such a stimulus to light-land farming that the strong wheat lands have receded in public estimation, and are at present most in need of improvement. Yet Mr. Lawes has proved that, even by the ordinary methods of cultivation, about two quarters of wheat per acre may be grown on strong land for twenty years in succession, without manure; and Mr. Smith, of Lois Weedon, has carried this further, and shown that by a thorough disintegration of the soil, and repeated exposure of a fresh surface to the fertilizing effects of the atmosphere, at least four quarters of wheat per acre may be calculated upon as the average produce of moderately good wheat land for an equally long period. The only drawback to this gratifying result consists in the heavy cost of cultivating the stiff clays. The steam-plough is the most likely agent to get over this difficulty; and the able men who are at present engaged in arranging the great mass of information they have collected on this subject will, we trust, be able, in their reports, to show us the extent to which the employment of steam machinery in the cultivation of strong land has been commercially successful, and also to point out any special causes which have retarded its introduction and diminished its beneficial effects, whether arising from the imperfections of the machinery, or from improper modes of applying it (Hear, hear). One of the most promising features in the agricultural prospects of the present day is the almost unlimited demand which exists for many of those products which our soil and climate are especially adapted to produce in perfection. The western sides of Great Britain and Ireland are peculiarly well fitted for the breeding and rearing of live stock; yet our constantly-increasing imports show that the home-supply is by no means equal to the demand. If our acute, but misguided, fellow-countrymen in Ireland would abandon their Fenian follies, and devote themselves heartily to the cultivation of green crops and he improvement of their pasture lands, they might appropriate a large portion of the vast sums which are now expended in bringing live-stock from the most distant parts of Europe. Even now there are more cattle in Ireland than in England—3,493,000 against 3,307,000; and that number might with ease be very largely increased. Dairy produce, too, has for some years borne a very remunerative price, and needs fear no competition from distant countries. The effect of the cattle-plague on the supply of milk to large towns is remarkably illustrated by the quantity of milk now conveyed by railway for the supply of the metropolis. The seven great railway companies, who principally conduct this trade, have kindly furnished me with the following interesting particulars. One company says that the increase in the quantity carried in 1866 above that in 1864 is 86 per cent.; another company says their increase is 120 per cent.; a third, 352 per cent.; and the London and North-Western and Brighton Companies state their increase at fifty and sixty-fold respectively. There are now more than 220 stations sending milk to London, by passenger or special milk-trains, from distances varying from 7 to 190 miles, for a charge varying from a minimum of a ½d. to a maximum of 2d. per gallon for the whole distance. In the last three months, September, October, and November, 1866, which are the worst months in the year for the milk trade, no less than 1,652,000 gallons of milk have been brought into London by rail, showing that we should probably underrate the total quantity carried for the year 1866 if we stated it at 7,000,000 gallons. This is a remarkable instance of the rapidity with which so extensive a trade in an article which is difficult to move in large quantity, and which yet will not bear delay, has been transferred to new and distant localities when circumstances required it. It is to be hoped that this large introduction of good country milk will effect some improvements in the very unsuccessful mixture which has hitherto been sold under the name of London milk (Hear, hear, and laughter). The favourable prospects of which I have spoken are by no means confined to the western side of England. The drier climate of the eastern counties is specially adapted for the growth of first-rate barley, and the value of a little extra quality in the sample was never more highly appreciated than in the present season. The landowners of the eastern counties, however, must pardon me for saying that they do not make full use of their advanrages. Barley-growers will all tell you that they can only grow good barley on good land; but a large portion of the light sands have marl or clay in their immediate neighbourhood, and that marled sand will grow good barley is well known and extensively acted upon by many of the leading agriculturists in that district; but there are still thousands of acres of poor weak sands with marl in their midst, which only require a liberal application of it to double the value of the land, and to grow better barley than any yet imported from other countries. To watch for and promptly seize any opening for a profitable trade which the changing circumstances of the times may afford, and especially to turn thoroughly to account any peculiar advantages of soil, climate, or position, requires not only the shrewd sagacity for which our farmers are distinguished, but also a cultivated intellect, the result of a really good education, which, unfortunately, many of our farmers have not been able to obtain. In the endeavours which the Council have lately made to fix the attention of the agricultural world on this subject they have naturally felt that the amount of funds which could be spared for this purpose was so small as to be utterly inadequate to provide, or even materially assist in providing, the means of education for the most limited number of youths. They have therefore adopted the only course which was open to them—that, namely, of offering a few prizes of moderate amount for general competition, in the hope that this practical expression of opinion on the part of the Royal Agricultural Society would, at any rate, draw attention to the question, and might be of some value as an indication of the kind of education which is most required for young farmers, and in which they are most deficient at present (Hear, hear). By way of recapitulation, I wish, first, to urge strongly the importance of treating cattle-plague like a conflagration, and that it is as much a matter of ordinary prudence to keep up the machinery for stamping out the one as it is to keep fire-engines and firemen ready at a moment's notice to extinguish the other (Hear, hear). Secondly, I hope to see the method I have suggested of dealing with our labourers generally adopted, and supplemented by others of a similar character, whereby we may give the men local interests, and the strongest possible inducement to establish a kind of savings bank each in his own pigsty and cow-house, which is not unlikely to lead eventually to the savings bank in the neighbouring town (Hear, hear); but at all events this will increase the self-respect of the labourers themselves, and enable them to bring up their families in health and comfort (Hear). Thirdly, the education of the rising generation of farmers requires thoroughly overhauling and adapting to the wants of the day (Hear, hear). This movement has already begun in one or two counties; but there are many deep-seated prejudices to be removed, and there is much *vis inertiæ* to be overcome, before our middle-class education is brought up to the present high standard of English civilization (Hear, hear). Lastly, under the good providence of God, who has promised us a return of "seed time and harvest" so long as the world endures, the present prospects of English agriculture are highly encouraging. By means of the improved facilities of transport, both by sea and land, we are continually obtaining access to whole nations of new customers, and as long as our foreign trade continues to increase, so long will the consumption of our home-grown commodities be such as to provide a remunerating demand for all the beef and the beer, the milk, butter and cheese which he combined "Practice with Science" of our farmers may enable us to supply (cheers).

Mr. C. S. Read, M.P., said he was sure they all felt deeply indebted to the President for the able, learned, and valuable address which he had just delivered (cheers); and he was glad that an opportunity had thus been afforded of making that meeting something more than the dull routine meeting it had hitherto been (Hear, hear). There were one or two subjects in that address upon which he would venture to make a few observations. The Chairman had referred to the farmers in the eastern counties as growers of the best qualities of barley. Now, he would respectfully tell him that there were greater hindrances to the growing of barley than were to be met by the use of marl or clay (Hear, hear). It was impossible, with the present oppressive restrictions on barley-growers, for them to do what they wished in that respect (Hear, hear). With regard to the Chairman's able remarks on the question of giving labourers an interest in the farm by appropriating to them a certain quantity of pasture land, he (Mr. Read) could only say that in the eastern counties farmers were so badly off for pasture that they could not find food enough for their own cows, and consequently kept but very few. There was one thing which must, he thought, be kept in mind, namely, that the best way of dealing with the labour question was to have more task-work and less day-work (Hear, hear). As to wages, they in Norfolk had been twitted with paying only ten or twelve shillings a-week. He had gone through the figures connected with a farm of 1,000 acres of arable land for the last four years, and he had found that the average rate of wages received by the labourers was something like 13s. 6d. a-week, or between £30 and £40 a-year. There were certain classes of labour, such as the tending of stock and the care of improved implements, which required a man who had a head as well as hands, and such men must be paid, not by task work, but according to the ability which they devoted to their work. There were other kinds of labour which required a man with not merely a head but strong arms: he referred to such work as hedging and ditching; and a man who possessed the requisite strength would, of course, earn good wages at such employments. No system, he contended, could be worse than that of keeping labourers generally down to a certain level by paying them all so much a-day or so much a-week, instead of endeavouring to raise them to the highest point by employing them as much as possible on task work (Hear, hear.) One word with regard to the report which had just been presented. He could assure the Council that it did not come one day or one hour too soon (Hear). Outside that room there had been vague and unpleasant reports as to the condition of that Society; and it was satisfactory to learn that, notwithstanding all that the institution had gone through, the decrease in the number of members was not thousands or even hundreds, but only 97 (cheers). Moreover, although the Council had expended a certain amount of capital, there was, it appeared, still £18,000 in hand, which was surely enough for the wants of any society (Hear, hear). Then, again, it was pleasing to hear that the addition to that house, which had been considered only a nuisance to the neighbourhood and a disfigurement to the Square, was really and truly a very profitable investment of the society's funds. The Council had been charged with having chosen an out-of-the-way town—Bury St. Edmunds—for the next show, and had been told that neither the town nor the railway could provide proper accommodation; but in his opinion, though Bury was a small town, it would be found expansive enough for all the visitors to East Anglia, and he believed the railway accommodation would also prove sufficient. As regarded the list of educational prizes, he regretted to find the study of two sciences which were especially connected with agriculture, namely, geology and chemistry, so little encouraged in the competition. In conclusion, he thought that on the whole the Society had good grounds for being thankful for the past and looking forward hopefully to the future (cheers.)

Mr. S. Sidney thought the time had arrived when, with the means at its command and the influence it possessed, the Council might build up a monument of agricultural progress, which would be an enduring honour to the Society and to agriculture. They could command the assistance of noblemen and other large landlords, of practical farmers, of implement makers, and of all classes of agriculturists, and he thought that the information that could be supplied by all these should be made available. Let the Council begin by forming itself into a committee to consider the best means of carrying out this object, and he believed they would soon come to the conclusion that the best course would be to form a number of committees—one to take the subject of live stock, a second cultivation, a third manures, a fourth mechanical progress, and so on. A series of questions might be framed relating to the various subjects dealt with. At the same time there should be a map of England, divided not into counties, but into agricultural districts, and he believed there would soon be found in every district a zealous, voluntary, standing committee; and through the medium of the questions they would be enabled to show what had been done of late years for agriculture, what was the position of agriculture in its various branches at the time when the Society was founded, and what is its position at the present period. A large amount of most valuable information would be obtained, and the Society, as well as agriculture, could not fail to be benefited.

Dr. Crisp thought that if questions like those suggested by Mr. Sidney were sent out to farmers in various parts of the country the result would be that the Council would obtain such a mass of chaotic information that it would be almost impossible to separate the wheat from the chaff. As regarded the *Journal*, he must say that the members had a great deal for their money. No man could very well object to pay a guinea subscription, considering that he received for it two copies of the *Journal* a year. Whatever might be said of the quality, no one could complain of the quantity (laughter). Now, he had always thought—they must pardon him for saying so—that that Society had been a great obstructive to the progress of medical science. The Society had prevented the Government from doing what it ought to do; and he believed that until the Government took up the question of agricultural education they would never have a good and efficient system. Professors should be appointed by the State, whose whole time would be devoted to the elucidation of what would be most beneficial in different departments of agriculture. He did not agree with the Chairman that the losses from the cattle-plague amounted only to £3,000,000; he thought £6,000,000 would be nearer the mark (Hear, hear). With respect to the cattle-plague, it would be recollected that some time before it reached this country Professor Simonds and Mr. Erne were sent out by the Royal Agricultural Society, the Scotch society, and the Irish society to investigate the matter. He did not wish to reflect on those gentlemen, who, no doubt, did their best, considering the time allowed for their labours. But what was their report? Why, that there were so many military cordons between this country and the countries where the plague existed, that it was impossible it could reach our own shores. He believed that if this matter had been managed by the Government they would never have had the cattle-plague. What was the present position of farmers with regard to the importation of diseases from abroad? During the last week or two he went down to the neighbourhood of Harwich to investigate smallpox in sheep. A large quantity of foreign sheep were brought to the port of Harwich. Those sheep were distributed about, and almost as a matter of necessity disease was distributed about the neighbourhood. If a farmer had small-pox among his sheep, he was compelled to confine them to his own parish or district, various restrictions were imposed upon him, and he got no compensation. He was confident that unless a very different system were adopted with regard to foreign sheep, unless the animals were killed at the port of landing, a very great loss would be sustained. He believed that the 6,000 sheep reported to have died of cattle-plague did not represent half the actual number; and it was very hard upon English farmers that they should be liable to have their sheep infected, and have no redress. If foreign sheep and cattle were to be imported into this country, proper means must be taken to prevent them from spreading disease; and he held that if proper means were not taken, the Government were responsible, and ought to compensate those who suffered (Hear, hear).

Sir Massey Lopez said he should like to mention one fact in confirmation of what the Chairman had said with regard to the maintenance of the present restrictions on the cattle trade. Previous to the establishment of the restrictions at the ports of debarkation, farmers in his locality suffered very much from the importation of foot-and-mouth disease; but during the last twelvemonth there had not been a case of that sort in his neighbourhood (South Devon). He mentioned this to show how important it was that the restrictions should be maintained. Of course, the malady which he had mentioned was not so fatal as rinderpest, but still it was one from which farmers had suffered very much.

Mr. Albert Pell said: Next to the evil of having the cattle plague in the country was that of a constant reference to it, and having himself worked very laboriously in connection with it, and paid considerable attention to it, he must say that he thought the discussion of it might now very fairly be dropped (Hear, hear). There were certain points referred to in the admirable address of the Chairman which he should like to have seen to a certain extent amplified. First, with regard to a question which was of special importance to them as farmers—the question of labour. The Chairman attributed the excessive price of labour to one of many causes. One cause which had been most injurious to farmers had, thank God, been removed; he referred to the law of settlement. In his county that law had the effect of driving people from one neighbourhood to another irrespective of the price of labour. Near him there were at the present moment cottages being built on sites of cottages which were pulled down, and inducements of all kinds were being held out to bring back the hands which were so foolishly driven away (Hear, hear). He was not going into the question of the law of settlement. All he would say was that he hoped the principle on which the Legislature had acted would have a wider application. The Chairman had referred also to co-operation among labourers. Now, he could not for a moment believe that the principle of co-operation, in the way in which they understood it, could be carried out to anything like success as between the owner of capital and the labourer who was paid out of that capital. But there was an indirect application of the principle which he had found in his own experience very useful. A year or two ago he became connected by purchase with a very poor parish in the Midland counties. That parish was a by-word far and wide; it was described as a scene of constant drunkenness, dissoluteness, and irregular habits, though at the same time the people living in it were employed in one of the most lucrative trades in England. Having had some experience of the working of the system, he put himself in communication with some of the originators of the co-operative stores with a view to a trial. There had now been established there for about 18 months a small store, in which they were turning over a thousand pounds a-year. There was a very small capital, and all of it, without the exception of a single penny, was the result of the savings of men who they were told before had nothing whatever in their pockets, and whose pockets were so ragged that if any money were put into them it would drop out (laughter). But they had carried the principle still further. Holding as they did that good beer was the legitimate drink of all Englishmen (Hear, hear), they had introduced into that house the sale of beer against the premonitory caution and advice of the clergyman who had had long experience, and in the face of three or four public-houses situated in the midst of a population of only 600 people (cheers). The sale of beer had been going on now for eight months, and the result was that they had a very large trade in very excellent beer, such beer as no gentleman in that room could be otherwise than glad to drink, either on a hot or a cold day (laughter). It was sold as low as 4d. a gallon, and as high as 2s. The result was that the very clergyman who cautioned them against the introduction of beer said, that in the evening the streets were quieter than they were a year ago (cheers). That might be due to some change in his sermons, or it might be due to a change in the quality of the beer (laughter). But they had gone farther; they had closed one of the public-houses of the village. and they had established a reading-room in connection with the stores. They had not a squire resident in the parish, and they did not receive from outside their own borders, with the exception of one guinea a year, a single penny to assist them. With regard to the education of the poor, he would remark that that was a very wide question, and he believed it was more of a Parliamentary question than one which could be decided by an assembly like that. But let him see whether he could not make a suggestion which, spreading through the country, might be of practical use in reference to the education of children in union workhouses. Many of them were guardians of the poor; many of them went weekly into the schools of the unions. Now, did it not strike them that there was a very bad application of public money, or the money of the ratepayers, in the way in which the education was carried out? They had perhaps in their county some ten or twelve great unions, and they had an equal number of imperfectly-educated and under-paid schoolmistresses. They had in connection with the school the association of very young children with persons whom they knew to be among the worst of characters. The children were constantly brought in contact with the mothers of illegitimate children and persons whose example could scarcely do otherwise than contaminate girls who were growing up towards womanhood. Now, it did strike him that it would be well to adopt the suggestion made on that subject by an excellent nobleman, one to whom the country was largely indebted for the suppression of the cattle plague, namely, that they should adopt the Metropolitan system with respect to pauper children—that there should be a school to which such children should be removed immediately they were ready for education—a school where there would be one or two good mistresses, and where the children would be free from those contaminating influences which he had alluded to (Hear, hear). This was done in a parish in London with which he was connected by ownership—St. George's-in-the-East. Children there, instead of remaining in the union house, were placed in a school away from it, and the result was such as he could wish to see in agricultural parishes. Now, before sitting down he wished to put a question to the Chairman on a point which was referred to in the early part of the chairman's address; he alluded to the statement that the objects of the Society were limited by the terms of the charter. There had been a rumour abroad that an attempt was to be made to alter the character of the Society by a change in that portion of the charter which referred to their dealing with questions which were pending in Parliament. Now, he had been a member of that Society for something like six-and-twenty years, though he had very seldom attended in that room, and had, he believed, never before spoken, and he must say that his own private opinion was that it would be very injudicious to make the alteration in question (cheers); and he would now ask the President to be good enough to state whether there was any intention on the part of the governing body of seeking a change in that respect?

Mr. **Edmunds**, of Rugby, said he had on a previous occasion submitted to the Council whether it was desirable to continue offering prizes for implements which did not require any further improvement. Could there, for example, be any mprovement on Gardner's turnip-cutter? (Cries of "Yes.") It was all very well to offer prizes with a view to improved steam cultivation; but when they had got what they wanted, where was the necessity of offering a prize for it? (Hear, hear.) Gardner's turnip-cutter was stamped with the approval of the Society twenty years ago, and yet the same thing occurred at Norwich. As regarded the education of the poor, he thought that was scarcely a question that belonged to the Royal Agricultural Society—it was the education of the sons of farmers which most interested them as a Society ("Oh, oh"). He maintained that the poor were as well cared for under the Government system of education as it was possible for them to be, and that it was their own fault if they were not well educated. He admitted that the Society had done much by means of its *Journal* and in other ways to improve the agriculture of the kingdom, and all he and others desired was that it should take care to do what all the rest of the world was doing—namely, move on. If the Society was to represent agriculture, it must take up every question connected with agriculture. He wished the Society instead of having only 5,000 members had 50,000, so that it would be able to make its voice felt in the nation as commerce made its voice felt. It was not said that commerce belonged to any particular party; but if any question arose in connection with agriculture, they were sure to be told that it belonged to a particular party (Hear, hear). What he wanted was to see the Society really representing the feelings of the combined agriculturists of the kingdom, and in that case it would approach the Government and Parliament with a weight which would ensure the speedy redress of any real grievances (Hear, hear). He was glad that the Society had offered two education prizes in the shape of scholarships. As to the prizes of £2 and £3, though he did not like opposing them, he must say that he thought the money would have been better employed in paying for the education of boys at a college, or in placing them under the training of some farmer of eminence.

Mr. H. **Woods** said the last speaker had rather reproved the Council for offering a prize for the best turnip-cutter. In his opinion that reproof was not deserved (Hear, hear). As a practical man he felt very strongly that even Gardner's turnip-cutter was capable of great improvement (cheers), and he sincerely thanked the Council for having continued to offer a prize. Adverting to what had been said respecting farmers' sons, he would observe that though he had for many years been an advocate for sound practical education, yet he felt convinced that a number of men who were springing up every year, and endeavouring to teach farmers how to cultivate land and to produce meat, had done a great deal of mischief. That man was the best farmer who made the most money out of land, and kept it in the best condition (Hear, hear). Some years ago in the district with which he was connected a farmer took a farm which was considered very poor. After the lapse of a few years he was ruined, and everyone considered his case one of great hardship. Another man took the farm at an increased rental; but he was a sound, practical farmer, and was at this day one of the winners of prizes at the annual show of the Smithfield Club and other exhibitions of the same kind. That man pretended to no scientific knowledge; but he had a great deal of practical knowledge. Not only did he get a living on the farm, but he saved money. He had placed out five or six sons, who were now occupying large farms, and were men of influence in their localities. He believed that when that man began he had only sufficient capital for the farm which he occupied. He was, as the meeting must feel, a model practical farmer, instead of being one of those who had too little knowledge, too little practice, and too much theory (laughter).

Mr. **James Caird** said there was one important question not embraced in the admirable address from the chair, to which he desired for a moment to allude. No doubt, most of the gentlemen present had learnt from the newspapers that there was some prospect of a cessation of the supply of Peruvian guano. It had been rumoured that the supply might any day altogether stop. Those who were conversant with the subject would recollect that fifteen or sixteen years ago a good deal of agitation arose on this question. At that period the Government gave orders to the admiral on the Pacific station to make inquiries as to the probable extent of the supplies of guano available for agriculture. The admiral made a report, and he well remembered that every one who was interested in the matter was very much startled at its contents. He reported that, so far as he could ascertain, in about eight years from that period—namely, 1852—the supplies would be totally at an end, if the existing rate of consumption continued. That rate of consumption had not diminished, but had rather increased; but still up to this day there was no proof given that the supplies had been materially affected. Recently, however, a report had reached this country, from which it would appear that that which was prognosticated as destined to happen at the end of eight years from 1852 was now about to occur—that the quantity taken away from the islands had been so great that they might hear any day of the cessation of the supply. He believed that information of an authentic character on this point was now in the hands of the Government. Under these circumstances, he would suggest to the Council that they might render valuable service to agriculture by representing to the Government the importance of obtaining full and accurate information with regard to the remaining supply of Peruvian guano, asking them whether they had any authentic information on the subject; and if they replied in the negative, urging them to take steps to ascertain whether the report to which he had alluded was correct. Let it be remembered that to say that the supply of Peruvian guano was nearly exhausted was equivalent to saying that the price of all other manures must be immediately enhanced (Hear, hear).

Mr. Lawson wished to say one word on the labour question, in which he felt deeply interested. They had, no doubt, all seen what was said by Lord George Manners the other day about applying the co-operative principle to the case of agricultural labourers. He (Mr. Lawson) had himself adopted a plan something like that which was thus suggested. He was a struggling farmer in the north of England, and at the beginning of the present year he told those whom he employed that he would give one-tenth of his income this year to be divided among them in proportion to the amount of their wages. He had nothing to say about beer.

A Member: That tenth came out of the profits of farming?

Mr. Lawson: It was chiefly farming. As regarded beer, the sale of which was so strongly advocated by Mr. Albert Pell, he would remark that, though there were about 600 co-operative societies in this country, not half-a-dozen of them supplied beer.

Mr. Simons hoped it would not go forth that it was the opinion of the members of that society that it was possible for farmers to raise the price of labour. That was, in fact, quite impossible; those who attempted it would be ruined; and when he heard benevolent persons dwelling on the duty of raising the wages of labourers, he always replied, "Try it yourself" (Hear, hear, and laughter).

Mr. W. Torr believed that, however they might talk on that subject, they must all come to the same point, namely, that the price of labour must, like everything else, be regulated by supply and demand (Hear, hear). One of the greatest drawbacks on farming at the present time was the great advance in the price of labour, and the increased cost of cultivation in consequence, and it was not fair to farmers to say that the wages of agricultural labourers had not been increased in proportion to those of other industrial classes of society. He believed that the wages of agricultural labourers had advanced more than those of any other class of labourers during the last seven years. With the improved style of farming, an increased price of labour was inevitable. If they wanted a better or higher class of labour they must pay for it. Of course, one thing that had increased the price of labour was emigration, which in the rural districts at all events had been going on rather too fast. Formerly emigration was looked upon as rather beneficial in removing an inferior class of labourers, but now it took from them the best labourers instead of the worst. Many farmers had now found that it was better to pay 3s. a-day for a good labourer than 2s. 6d. for a bad one, inferior labour being in all cases the worst labour. He might remark that it was his practice on his farm to assist his labourers by giving them milk. Having 12 or 14 cows he gave the milk of one of them, which used to be valued at 8 guineas a-year, but might now be put down at 10 gs. He thought the landlords of England ought to go hand in hand with the tenants in endeavouring to improve the cottages of the labourers, and he thought one means of doing that would be to include cottages in the rent of the farm ("No, no.") He meant to a certain extent, say to the extent of one cottage to every hundred acres of land. There was a great cry now for three-roomed cottages; but he thought it would be best to have half with three rooms and the other half with two. When a labourer was first married he could only buy furniture enough for two rooms, and he would be better off with a small cottage than a large one. He allowed every one of his labourers a small portion of land for potatoes, from 600 to 800 square yards. It was cultivated for them, and they had only to put in the seed. The tenant should, in his opinion, look upon his labourers almost as part of his household, and if he were aided by a kind and liberal landlord the result must be the improvement of agriculture (Hear, hear).

Mr. Duckham agreed with Dr. Crisp that the loss arising from the cattle plague had exceeded £3,000,000. It should be remembered too that in many cases the loss was irreparable, as the animals slaughtered belonged to pedigree stock, and could not be replaced. He could have wished that something had been said by the Chairman respecting the prevention of various contagious diseases. Enormous losses had been sustained throughout the kingdom from pleuro-pneumonia. He believed he was not wrong in saying that the total loss since the first visitation exceeded that occasioned by the cattle plague; yet only thirty years ago pleuro-pneumonia was not known in this country. He thought the Council would render valuable assistance to agriculture by urging upon the Home Office the necessity of establishing a better system as regarded the sale of animals, both home and foreign, in the various markets of the country.

The Chairman, in replying, said some remarks had been made on points raised by his address, which he should like to notice. Mr. Read referred to the difficulty of finding grass land to allot to labourers in certain districts, one district being his own. He would suggest to that gentleman that if he were to try the plan of putting some inferior grass lands in the hands of his labourers, he might find that they were the best improvers of land that he could have. He believed they would make that land superior at all events to the average run of grass land. Mr. Torr had mentioned another method of doing what he (the Chairman) recommended—namely, giving milk to labourers. One thing might answer in one neighbourhood, and another in a different one; but what he objected to was the condemnation of a particular plan by those who had never tried that or anything else of a similar kind. If a man who had tried a plan which was recommended said that he had found it was not so good for his labourers as some other plan, he was bound to respect his opinion; but if a man who had never tried it told him he was sure it would not answer, and that certain evil results would follow, he could not admit the validity of such a mode of objection. Mr. Sidney's suggestion that there should be an agricultural survey, of course could not be dealt with then: it would be referred to the Council, and dealt with on its own merits. Mr. Pell's question with regard to the charter compelled him to say one or two words on that subject. A false impression had got abroad that the object of the Council in dealing with the charter was to do away with the prohibition of the discussion of political questions in that Society. That was not the intention. The intention was, if there was a restriction in the charter which now prevented it, to have such an alteration made as would enable them to discuss questions which, though they were before Parliament, were not political questions (Hear, hear). There were agricultural questions, the interest in which was not confined to one side or the other of the Houses of Parliament, and which did not in any way trench upon politics, except that they were before the Legislature. Such questions as those the Council conceived might properly be dealt with by that Society; and when a question of that kind arose recently—he referred to the case of the cattle plague—the Council, though there were restrictions in the charter which, strictly interpreted, might have seemed to mitigate against it, did deal with that question, and used their influence in a way which he believed was very useful last winter. Having explained that that was the object of the alteration, and not the sweeping one of admitting politics, he would refer the meeting for further information on that point to Mr. Holland, who was on the committee to which the matter was referred. The committee met that morning. Mr. Holland would tell them the result of what took place. Mr. Edmunds had suggested that they should not offer prizes for implements which seemed to be as good as they could be. Now, he would say in answer to that, in the first place, that implements which had been thought to be as good as they could be when brought into competition with new inventions, had had to give place to them, the supposed perfection not having been really attained (Hear, hear). Again, even supposing particular instruments were as good as they could be, it was very desirable that anyone who visited the show-yard should be able to see what was the best implement of a particular kind that could be bought, whether it were an old implement or a new one. Mr. Caird put a question with regard to the supply of guano, which was exceedingly useful. The Council would certainly take an opportunity of ascertaining whether any information that was likely to be useful was possessed by the Government. If there were, no doubt they would communicate it, as had been done before on similar occasions; and if the case should be otherwise, it would be suggested to them that the consuls nearest the spot should obtain authentic information. He would only say, in conclusion, that he was very glad indeed that gentlemen who attended that meeting had thrown out so many practical suggestions. Whether they would bear examination or not, they at all events bore on questions of interest which were open to discussion there; one great object of that Society was, to bring together for the purpose of discussion those who had a common interest in agriculture (cheers).

Mr. **HOLLAND**, M.P.: I will simply say that the Committee met this morning, and came to the determination not to recommend any amendment of the charter (Hear, hear). The grounds upon which they came to that resolution were these: The two questions to be considered were the question of education and the question whether the Council had any power to take into their consideration matters not political but agricultural which were before the Legislature. We found that in practice we have been acting up to any amendment which could be made in the charter. For during the whole of this year, though it was opposed to the mere wording of the charter, we have been occupied in considering questions relating to the cattle-plague, markets, and so forth, and we have more or less been upheld in our proceedings in opposition to the charter by the very body—namely, the Privy Council—who gave us that charter. If they sanctioned our proceedings, we are not likely to be called to account for them (Hear, hear). On the other hand, we took into consideration the best mode of dealing with all the dangerous questions which might be brought before us, but which now need not be brought before us in order to ensure their being dealt with. There has lately been established a Central Chamber of Agriculture, having local chambers connected with it, where there is no charter, and where members can bring forward any subject they please; and large bodies of agriculturists throughout the country may now collect together, as has been done in Scotland, for the purpose of expressing their opinions and bringing them to bear on the Government. We think it better, therefore, that we should confine ourselves to practical matters connected with the Society, and therefore our report to the Council will be that we do not recommend any alteration of the Charter (Hear, hear).

The Rev. J. **NODDER** moved a vote of thanks to the auditors, which was seconded by Mr. **ARKELL**, who took the opportunity of calling upon the Council to urge the Government to adopt the most stringent measures of a permanent character to prevent the future importation of the cattle plague, and other contagious diseases, from abroad. English graziers having made the sacrifice involved in the slaughter of cattle in their own immediate districts, and sending it to London as dead meat, it surely was not too much to require of the importers of fat cattle that they should slaughter at the ports. If that measure were not adopted, the necessity would be imposed of placing greater restrictions upon Islington market. Mr. Arkell added, that so pleased was he with the able and comprehensive review of agricultural affairs laid before the meeting by the President, that he hoped the hon. gentleman's example would be followed by his successors.

The motion was agreed to, and Messrs. Astbury and Corbet were re-elected auditors; and Mr. Francis Sherborn, of Bedfont, was, on the motion of Major-General **HOOD**, seconded by Lord **TREDEGAR**, appointed as their colleague, to fill the vacancy occasioned by the death of Mr. Cohen.

Sir **WALTER STIRLING**: There is one duty which is left to us to perform, that of returning thanks to the Chairman (loud cheers), not only for the manner in which he has conducted the business of the meeting, but for the admirable essay with which he favoured us in the early part of the day (renewed cheers). It appears to me that if ever there was a man who more thoroughly understood, and sensibly felt, the responsibility of his office than another, it is our excellent President, Mr. Thompson (cheers); and, if I might be allowed to indulge in any terms of self-gratulation on this occasion, I would say that when I, though possibly most unworthy of the honour conferred upon me, was asked to propose him as President, I felt that I myself, in so proposing him, was the means of conferring an essential advantage upon the Royal Agricultural Society (cheers). Again, with regard to the questions which have been touched upon by the several gentlemen who have taken part in the discussion to-day, whatever they may be, I am perfectly satisfied that they cannot be transferred to a more valuable judgment than that of our excellent President for the disposal of them (Hear, hear). I believe that you all fully agree with me in these remarks, and will cordially assent to the proposition I now make to you of offering our most hearty thanks to Mr. Thompson for his conduct in the chair, and for the other services which he has rendered the Society (cheers).

Mr. **COLEMAN** having seconded the motion, it was put to the meeting by Lord **WALSINGHAM**, and carried with enthusiasm.

The **PRESIDENT**, on rising to make his acknowledgments, was hailed with a fresh burst of cheering. He said: I am exceedingly obliged to you, gentlemen, for this mark of your kindness, and to Sir Walter Stirling, not only for proposing the vote of thanks, but for nominating me originally as President of the Society. I am the more indebted to him, because any thanks that are expressed by him are dictated solely by public considerations, for I have not the honour of his private and personal acquaintance (cheers). So far as the Royal Agricultural Society is concerned, it is entitled to my best services during the twelve months; and all I can say is, that it shall have them (cheers).

The meeting then separated.

CENTRAL CHAMBER OF AGRICULTURE.

The first general meeting of the members of this recently-formed association, branches of which are now being established in different parts of the kingdom, took place on the Wednesday in the Smithfield Show week at the London Coffee-house, immediately after a preparatory meeting of the Council on the same day. The chair was taken by Mr. Albert Pell, of Hazelbeach Hill, Northampton. The attendance was not numerous, but it included delegates from some local chambers of agriculture.

The **CHAIRMAN**, in opening the proceedings, said that that was the first general meeting of the Central Chamber of Agriculture—an institution which had had its origin within the year 1866; but although its origin had been so recent, the want of it was not of so late a date as the present year. For a long time an almost universal feeling had been entertained that something of the nature of that which they were inaugurating that day was required for the advance and support of the interests of the landowners and farmers of this country, usually termed the landed interest; but it was chiefly to the labours and exertions of their Honorary Secretary, Mr. Charles Clay, of Wakefield, that the meeting they were then holding was due. To pass from that subject, however, he must be allowed to say that they owed their existence to what some persons had been pleased to term a defect in the charter of the Royal Agricultural Society. He himself did not hold it to be any defect whatever; but in that charter it was distinctly laid down that that great Society should entertain no question which was pending in the Legislature. The motto of that Society was "Practice with Science;" and so far as he had known it for 26 years, he believed it had fully acted up to that principle. They had been reminded by writers in the public press that they were attempting to do what was not needed, because an older, and certainly a greater, society than they were could do what they proposed to do by a simple change in their charter. He wished then to clear up that point once for all, conclusively and decidedly. He had made it his business that day to attend the general meeting of the members of the Royal Agricultural Society, and he put that question distinctly to the chairman; and although he was obliged to leave before it was answered, he was told that his answer was to the effect that the Royal Agricultural Society had very recently—he believed that morning—been considering that very point, and had decided to leave the charter untouched and unaltered, partly because, as one speaker said, they thought the charter worked well in its present shape, and because there was a new institution afloat which promised to deal with political questions affecting agriculture in at least as clear, if not in a better, manner than an older society, indoctrinated with certain ideas, could ever accomplish. They knew the footing on which they stood with regard to the Royal Agricultural Society. Let them look for a moment at their footing as regarded the local associations. They were of great importance, and he distinctly asserted that no successful attempt was ever made to draw all these small societies into one including bond, until this Central Chamber had undertaken it. Knowing that the farmers were a class of men who, from their position and circumstances, were not very ready or able to come together at public meetings, they hoped to arrange such a system that, in spite of that natural obstacle to getting the expression of their views, they would be able to receive it in London, embody it, put it before the public in a succinct and concise form, and direct it with a home thrust at Downing-street, or St. Stephen's itself, if needed (Hear, hear). The question was, whether the thing was wanted at all. Because if the Royal Agricultural Society had worked well under the old system, they were wasting their time and doing mischief by attempting to initiate a new one. They had read of the days when Israel, in the face of the Philistines, had no smith within their borders, and that they went hither and thither everyman to point his share or to furbish his weapons; and that had been very much the condition of the farmers of England up to that moment. If they wished to bring before the Government a question of the most vital importance to themselves, they had first of all to spend a day in ascertaining what branch of the Government they were to communicate with. The next point was, were they, as tenant-farmers, the proper gentlemen to entertain such questions at all. That was another embarrassing thing. Then what said the Court of Quarter Sessions? That was another embarrassment. Then what said the Royal Agricultural Society? Well, all that was exceedingly embarrassing. Then, with regard to the department of Government to which they should go. They might go to the Prime Minister. They might go to the Home-office. They might descend still lower—to that vague and incomprehensible abyss, the Board of Trade. They had it then riddled out into something more distinct in the Queen's Stationery-office at Westminster—a department headed by Col. Harness. Surely, that was not precisely the way in which to deal with so great and important an interest as Agriculture in 1866; and he must say that the time had arrived when it was for them, and societies in connection with them, to set about altering and improving it. In his opinion they were entitled to claim a distinct department, either in the Board of Trade, which was merely a Committee of the Privy Council, or they might go further, and this might be still more useful and lead to something more distinctly beneficial: they might claim a Minister of Agriculture and a separate department in the Government (loud cheers). Be that as it might, however, he thought that some alteration must be made, and that alteration might be discussed on some future day by those who were then present, and by the representatives of local Chambers, who, he had no doubt, would attend to aid them in such a discussion. He wished now to refer for a moment to some of the action taken by the Council during the past year, in order to show how useful it would have been to the community at large had they been recognised and consulted by the State. In November last they held a Council meeting in London, which was attended by gentlemen who were large capitalists and proprietors of land from all parts of England. Some of them were from the north, others from the far west, some from the south, and many from the centre of England; and at that meeting it was the unanimous opinion, carried by acclamation, that the existing restrictions which they had won with so much difficulty from the Whig Government, and the maintenance of which they had pressed upon the Conservative Government, should not be tampered with or modified, at least until the first of the new year. That resolution he had had the instructions of the Council to communicate either to the Privy Council or to Col. Harness, as might be most practicable. Accordingly he went down to Westminster, and discovered that gentleman's office in the midst of the public Stationery. Unfortunately, however, he was too early for Col. Harness in the first instance—it was about half-past nine or ten, and too late also on his second visit, which was about two o'clock. But he had had put into his hands that which was as conclusive as any interview he could have had with him—namely, one of the last orders in Council, that which had been agreed to the 17th of November, and which set forth that, on the application of the local authorities, and subject to certain conditions, English markets might be opened again for the trade and traffic in cattle. He believed that a more injudicious modification of good orders was never passed, more unwished for by the owners of stock, more uncalled for by the men whose money was invested in that all important part of their farm produce. Who it was who pressed the advisability of doing that he knew not. (A voice: "The boroughs"). Clearly and decidedly it was not the farmers or the great landowners, as far as he knew them (Hear, hear). Now, observe the ill effects of that: the cattle plague was increasing (Hear, hear); but he had been asked, how could he connect the increase of the cattle plague with the relaxation of the orders, when that relaxation had not extended to the county where the disease was again breaking out? How did he connect it! Was not that order of the 7th of November, as distinctly as it could be, an assertion that the cattle plague had left, or was leaving, their borders—that it was either abating in its virulence or departing from the country? But if there was still any doubt as to the interpretation to be put upon it, surely the action of the Archbishop of Canterbury was quite conclusive upon the subject; for in Hazelbeach Church they had been thanking God for the extinction of the cattle plague, though it had increased fifteen-fold last week (Hear, hear). He would tell them how he connected that order of November with the increase of the plague. It led the magistrates to believe that they might be more lax, and encouraged the public to be more careless as to the measures to be taken for keeping it down. Most certainly, it had led to carelessness on the part of the workmen, because the inspectors were dismissed, and when the plague broke out again there were no inspectors to report it. Such, then, he contended, was the effect of that order. In those circumstances a series of resolutions would be moved that day, which, if concurred in by the meeting, the Council proposed to lay before the Government on the following day. He would not, therefore, enlarge further on that point at that moment. There was one observation, however, which he wished to make in connection with the local Chambers of Agriculture. They, the Central Chamber, thought it would be desirable to prompt the local Chambers in England upon the questions which they should entertain in their infancy; and he believed he expressed the opinion of the majority of the Council when he said that they should deal with nothing that was merely theoretical or philosophical (Hear), but with matters that came within the compass of their own knowledge, and which they might deal with to some practical end (Hear, hear). And here he desired to mention that there was one subject on which he thought they could unite not only all the local Chambers in their favour, but many who had not yet joined them; he referred to the unfair and unequal basis of the poor-rates (Hear, hear). There were large tracts of valuable property in this country which were wholly exempt from poor-rates, with the object of affording protection for their produce. Let them take, as an instance, timber (Hear, hear). That, he concluded, was exempted from the poor-rate in former times by reason of considerations connected with the "wooden walls of Old England." Again, take coals: if coals were wrought in a pit open to air they were subject to poor-rates, but if won through a shaft they were exempted.

Mr. J. Abbs (Sunderland) wished to correct the statement just made. He came from a coal district, and could assure them that both were liable to rates; lead, iron, and other minerals were exempted. The Act of Parliament expressly mentioned coal mines: other mines continued free.

The Chairman: Here at all events was an example of the advantage they would derive from their Chamber; they would get at the right information (Hear, hear). And he thought that the basis on which the poor-rate was assessed was a question which it was desirable that the local chamber should deal with. After treating the collection and assessment of the poor-rate, they might go further and consider its distribution. That in turn would open up the law of settlement, and so they might advance from one branch to another of that important subject (Hear, hear).

The code of rules for the government of the new Chamber, as settled by the Council, was put to the vote and agreed to unanimously, with two or three verbal alterations of small moment.

The Chairman next read the following report of the Council, which was ordered to be printed and circulated :

REPORT.

"Your Council have to congratulate the members on this their first annual meeting, on the very successful and influential position which the Central Chamber of Agriculture has attained in so short a period. It is sufficiently evident from this success that such an association was much wanted; in fact, the very existence of the requirement is proved by the readiness with which the country has responded to the invitation of the promoters. It is scarcely twelve months since the Chamber was introduced to public notice; and at the present time it numbers ninety subscription-members and about twenty local societies working in conjunction with and subscribing to the funds of this Chamber and sending deputies to its meetings. These local chambers may fairly be taken as averaging 150 members each, which will give 3,000 members, making with the Central Chamber 3,090 as the number of agriculturists now co-operating with the Central Council, whose opinions may thus readily be obtained on any subject affecting the agricultural interest. This your Council believe is a position never attained in so short a time by any other agricultural society, and we may confidently expect that another year will at least double the influence of this Chamber.

"The Council report that the chairman has received a letter from the secretary of the Scottish Chamber of Agriculture announcing the resolution of that important national institution to co-operate with the Central Chamber, and to contribute to their funds, doing us the honour of giving a seat *ex-officio* at their Council board for our chairman and vice-chairman or secretary, and requesting the same opportunity to be afforded to them in our Council.

"There is one feature of the establishment of the Central Chamber of Agriculture which it would be well not to lose sight of. The Council conceive that they afford an opportunity for giving effect to the opinions of members of farmers' clubs and agricultural societies on questions pending in Parliament or to be brought before the Government, by their deputies, if appointed, appearing in the Council, to represent their views. The exclusion of the political element from these clubs as a general rule appears, though inseparable from their quiet existence in the country, to have in many instances a deadening effect, which, it is possible, some co-operation with our Chamber might modify or remove.

"The Council have pleasure in stating that, although only in their infancy, yet they are able to meet all their liabilities up to the present time, and have a balance in hand to begin the next year with. A full statement of the accounts will be published, according to the rules, at the end of this month.

"A Council-meeting was held on the 6th of November last, when it was resolved that the Chairman should convey to the Prive Council the unanimous opinion of the Council of the Central Chamber in favour of continuing the then-existing restrictions upon cattle traffic to the end of this year. Your Council regret to say that, almost simultaneously, the Privy Council, entertaining different views, issued Orders modifying the old ones, and tending to a greater freedom in the trade and movement of cattle. Your Council are of opinion that this action of the Government was premature, ill-advised, and likely to prove a source of future trouble, by a revival of the cattle plague; and they wish particularly now to call the attention of the Chamber to the consideration of measures of a permanent character, to be recommended for adoption by the Government and Legislature, to guard against foreign infectioy, and any future outbreak of the cattle plague or other contagious disease."

Lord Berners wished to express his most cordial approbation of the object which the Society had in view, and his desire to co-operate with it in its work. During a practice of upwards of forty years, he had often felt regret that there was no chamber of agriculture, as there were chambers of commerce; and he thought that the agricultural interest had been placed in a disadvantageous position by reason of not having such a machinery for making its views properly known to the Legislature and the country (Hear, hear). He trusted that every means would be adopted to induce landowners as well as occupiers to join them in this movement, and that members of Parliament would be encouraged to attend their meetings, for he was satisfied that many gentlemen would have voted differently from what they had done on agricultural subjects, if they had had a body of practical men to inform them as to the particular measures which would be for the benefit of the agricultural interest.

Mr. Albert Pell was then re-elected Chairman for the ensuing year, on the motion of Mr. C. S. Read, M.P.

On the motion of Mr. Willson (Leicestershire), seconded by Mr. G. May (Tamworth), Mr. Robert Jasper More, M.P., was re-elected Vice-Chairman; on the motion of Mr. T. Horley, Jun. (Leamington), seconded by Mr. Meire, the Council were re-elected; and on the motion of Colonel Halford (Leicestershire), seconded by Mr. J. Baldwin (Stratford-on-Avon), Mr. Charles Clay, the Honorary Secretary, was appointed to the office of Treasurer.

Mr. T. Horley moved, "That this Chamber views with serious apprehension the opening of store markets and fairs; and feels confident that there is a serious danger of the spread of the cattle plague by the relaxation of the stringent regulations which have been in force since February last." He was quite sure that everyone present must feel that the danger of the disease spreading had been greatly increased by the relaxation of these regulations, and anyone who had a doubt on the subject need only to have been at the dinner of the Farmers' Club the previous day to have had that doubt removed; for on that occasion there was a large collection of the most influential occupiers of land in the country, and they entertained but one opinion on the subject. For his part he believed, and the opinion widely prevailed in his county, that the only persons who were interested in the opening of markets and fairs were a class of persons many of whom they would be better without—he referred to the cattle dealers (Hear, hear). If men would only make up their minds to conduct their own business themselves, as used to be the case some twenty years ago, he believed they would remove one great source of the spread of the disease; for the middle-men were the means of carrying many disorders, including the cattle plague, from one part of the kingdom to another.

Mr. Brewster (Shropshire) seconded the resolution; and said that one reason for his doing so was a fact that came under his personal observation last Monday week. Being in want of store cattle, he received a letter from a dealer, inviting him to look at some which he said he had in the yard at the Crewe railway-station. But, upon reaching Crewe, he ascertained that, instead of being at the station, they were in a field a mile-and-a half off. He went there to see them, and was informed by a neighbouring farmer that within a very short period he had buried fifty head of stock—in fact, all he had, and that these cattle were grazing in the field adjoining. Now he thought there must be something very wrong about the November regulations in allowing these cattle to be removed to a distance of a mile-and-a-half from the Crewe station. Nay, he might have purchased and sent them into Shropshire without any further order.

Mr. Brandram (Hertfordshire) wished to state a fact which showed how the application for opening markets might and had been made. On Saturday fortnight, a petition, asking the authorities for permission to open the market in his neighbourhood for cattle intended for immediate slaughter, was brought to him for his signature, and, knowing the parties, he signed it. On no account, however, would he have done so if it had been in favour of opening the store-cattle market. That petition was laid before the local cattle-plague committee at Hertford; and it subsequently turned out that the words "for immediate slaughter" had been run through with a pen after a number of signatures had been obtained to the document. He was sorry to say that all his efforts to trace the author of this piece of wickedness had failed.

The Chairman asked whether the petition had been presented in its altered form?

Mr. Brandram answered in the affirmative, and said that a more disgraceful thing he had never heard of. If he could discover the parties who did it he would spare no expense in order to bring them to justice.

Mr. May said that in Staffordshire the feeling was very strong in favour of keeping the markets closed—so strong, indeed, that an attempt had been made to provide a substitute for opening the markets. With this view, certain rules were submitted to, and approved by, the lord-lieutenant of the county, and then forwarded to the Privy Council in London; but nothing more was heard of them afterwards (a laugh).

The resolution, being put to a show of hands, was carried unanimously.

Mr. C. S. Read, M.P., in moving a series of resolutions containing suggestions for the future permanent regulation of the trade and traffic in live-stock, adverted to what had been remarked by a previous speaker on the subject of dealers. They had found out in Norfolk that they could not only do without the dealer, but, in a great measure, without markets; for the graziers went direct to the breeders, and the cattle came home to their farms in much better health and condition, and at a comparatively much cheaper rate than they had ever done before. On the other hand, the result of having no markets was, that they had had no disease, and up to the last fortnight there had been a marked cessation of the foot-and-mouth disease. Norwich Hill was re-opened about a month ago, and now they had the foot-and-mouth disease pretty generally amongst them again. He then moved the resolutions as follows:—

"The Central Chamber of Agriculture, deeming it necessary that permanent arrangements should be made by the Government to regulate the trade and traffic in live-stock, so as to prevent as far as possible the further introduction and spread of contagious and infectious disorders, respectfully recommend the following suggestions:—1. That the importation of foreign stock should be confined to certain ports specially licensed by Government, which ports should be provided with suitable markets, slaughter-houses, quarantine grounds, and officers. That all foreign fat-stock should be forthwith slaughtered at such markets, and that all foreign store stock should be subjected to 28 days' quarantine before they are permitted to remove inland. 2. That should the rinderpest or sheep-pox be again imported or break out afresh, slaughtering and compensating powers, similar to those of the Cattle Disease Act of February last, should at once be put in force, and the district proclaimed. 3. That stringent regulations should be made with regard to the expeditious transit and watering of animals conveyed on railways, and that a thorough cleansing of all trucks, pens, and layers, and the proper space and ventilation of the holds of cattle boats should be enforced by Government inspection. 4. That the wilful exposure of any animal suffering from such contagious and infectious diseases as rinderpest, pleuro-pneumonia, sheep-pox, scab, glanders, or foot-and-mouth disease, upon any highway, boat, or railway, or in any market or fair, should be an offence punishable with fine or imprisonment. 5. That a more stringent inspection of all dead-meat, especially that imported from countries known to be suffering from cattle plague, should be enforced by Government."

These resolutions having been seconded by Mr. Masfen, considerable discussion ensued as to the propriety of including in the 4th resolution, as an offence punishable with fine or imprisonment, the wilful exposure of animals suffering from "foot-and-mouth disease;" and the balance of opinion being against the retention of these words, they were eventually struck out.

Mr. Jasper More, M.P., dissented from the second resolution on the ground of his objection to the compensating powers it proposed to create.

This elicited from Mr. Holland, M.P., the observation that exactly the same machinery as at present could not exist; and Mr. More not pressing his views to a division, the whole string of resolutions, with the single alteration mentioned above, were ultimately agreed to.

The gentlemen who took the more prominent part in discussing the fourth resolution were Mr. Masfen, Mr. T. Browne, Mr. Wilson, Colonel Halford, Mr. Duckham, Mr. Goode, Mr. Meire, Mr. C. S. Read, M.P., and the Chairman.

One fact stated by the Chairman carried great weight with it in guiding the Chamber to a conclusion. It was that he had sent cattle in perfect health from his farm in Northamptonshire to another farm in Leicestershire, only 14 miles off, and that on their arrival at the latter place they were found to be suffering from the foot-and-mouth disease. Consequently, if the exposure of animals with the foot-and-mouth disease were included in the category of punishable offences, he himself would in that case have been liable to fine or imprisonment for a thing over which he had had no control whatever (Hear, hear).

A unanimous vote of thanks having been passed to the Chairman, that gentleman in acknowledging the compliment seized the opportunity to remove the impression which rather widely prevails, that there is some feeling of pique between the Farmers' Club in London and the Central Chamber of Agriculture. He could assure the meeting that there was not the slightest particle of such a feeling existent so far as he knew. The two institutions, it was true, were moving in the same direction, but not in the same groove. They were like two great armies, one on each side of a river, moving in parallel lines in the same direction to the attack on the same enemy. Whether they would be able to bridge over the river and unite at a common point hereafter remained to be seen. At all events, no effort should be wanting on his part to accomplish that object, if he believed it would be for the benefit of this Society and the older institution in Salisbury Square.

Thanks were also voted by acclamation to the Honorary Secretary, and the proceedings terminated.

THE SMITHFIELD CLUB CATTLE SHOW.

AT THE AGRICULTURAL HALL, ISLINGTON.

A decidedly short show is the first impression one gathers in a bird's-eye view from the gallery of the Agricultural Hall. And yet, under the circumstances, considering the difficulties breeders and feeders have had to contend against, the entry is as good or better than could have been expected; for the character of some of the classes is especially high. The opening section of Devons is, for instance, really famous, as the three classes of steers and oxen have seldom been better, and Mr. Farthing's Ox should stand in for the Cup. Mr. Overman's first, again, by the renowned Wellington, and full of Holkham blood, is as excellent a young beast as ever was fed; whilst Mr. Farthing comes to the front again amongst the cows: although looking from above the Harptree Gently has more style and symmetry than either of the Stowey cows placed above her. The Herefords, on the contrary, are the weak place of the whole exhibition, as there are only twenty-four entries of white-faces against forty-seven Devons and fifty-one Shorthorns. One of these, moreover, a very good ox, the property of Mr. Bettridge, having broken his leg in landing on Friday, was at once destroyed. Amongst the Shorthorns the great strength of the show centres manifestly over the cows and heifers, as Mr. Stratton's Garland and Lord Feversham's Princess are, in familiar phrase, "a pair of beauties," with Mr. Ferris's heifer—another admirable one to the eye, if she could not have been so good in her quality, as she just missed the third place. The Shorthorn cows include some still better known animals, such as Mr. Stratton's Diadem, Mr. Lynn's Pride, and the Messrs. Howard's Claret; but poor old Claret has grown very gaudy, and the pick was all between the other two, where the Cup at the time we write should rest. The Sussex appear to offer a better front than they have done of late, as the classes of Norfolk and Suffolk Polls are fairly filled; but there are only four Long-horns in two classes, and the Scotch Highlanders are by no means up to their wonted strength. The Scotch Polled beasts, on the contrary, are led off by one of the very finest animals in the yard, exhibited by the executors of the late Sir Gordon Cumming. There is not such a back to look down upon in the whole show, and Mr. M'Combie's entry, although placed second, had no chance whatever against the Altyre specimen. Even the Cup with many was held to be a foregone conclusion, or at least credited to Scotland, as Mr. Heath Harris' cross-bred is another wonder from above, well supported as he is by another happy "nick" shown by the Martins of Aberdeen.

With the sheep there is another strong lead, that is amongst the prime West-end sorts, as we take the Southdown to hold much the same rank amongst sheep that the Devon does amongst cattle. The two shearling classes were never better; for Mr. Moore, on the part of Lord Radnor, admitted to never having made up any pen superior to these, if they could only finish third; the Merton flock, as it will be found, having regained its supremacy, and certainly truer sheep have seldom been seen. In the old class the Duke of Richmond's and Lord Walsingham's were, taking the pens through, just of about equal weight; but Goodwood deservedly gained the pride of place, as being more blood-like than their rivals. Lord Berners is still invincible with his Leicesters, and Mr. Wigmore confirmed the favourable opinion of his Cotswold flock, which, as we said, was so generally expressed at Birmingham. Neither the Lincoln nor Romney Marsh varieties are in any force, and many of the exhibiters of Shropshires were quite satisfied with their experience of Bingley Hall, Lady Willoughby de Broke, Lord Wenlock, and Mr. Anderson May all declining any further competition. Mr. Henry Smith, however, brought on his lot, though he was defeated for first by Lord Chesham, who has been breeding from the stock of Mr. Thornton and the Messrs. Crane. The Oxfordshire Downs were not numerically imposing; but Mr. Tapp sent on an extraordinary pen of pure Exmoors, and Sir John Harpur Crewe was put "in reserve" with his Portlands, which did well, if not otherwise quite show sheep.

Some of the classes, the Devons more especially, took a deal of judging, but the pigs were very expeditiously disposed of, as the competition was not great. The prize list is mainly remarkable for the number of new men in, and old hands out of it. Mr. Underwood, Mr. Mitchell, Captain Pelham Warren, Mr. Biggs, of Cubbbington, and Mr. Pittman King are none of them names very familiar hitherto in the chronicles of the Smithfield Club; while exhibitors like General Hood, Mr. Stearn, Mr. Sexton, and Lord Radnor, had to be content with, at best, lesser honours or merely complimentary notifications.

The attendance during the earlier part of the day was very thin, scarcely a member or an exhibitor coming to meet the judges on the opening of the Court; nor for the next hour or two did the attendance increase very perceptibly. Indeed, on the experience of this morning, we can see little or no reason why the public should not, under certain easily-arranged conditions, be admitted, as they are elsewhere, to the body of the building during the time the awards are being determined.

The above report embodies a more general view, as taken from the galleries; while we now proceed to amplify these remarks, merely stating that the general character which we have given the show has been in every way borne out.

The *Devon* classes are strong in numbers and character. In Class 1, Mr. John Overman once more comes to the front, and wins the first prize with a beautiful steer exceedingly well got up: he has a compact frame loaded with prime flesh, and very kind looks. Mr. Smith takes second prize with a very complete steer, nearly equal in quality and form to his competitor, and three months younger. In Class 2, Mr. Thomas Bond takes the first honour with a steer having a very deep forequarter and full breast: his ribs and thighs not good, rather flat sides, and body too large. Mr. W. Smith takes second prize in this class also. His steer is of better quality, and has a capital purse, but not so even as No. 1. Mr. W. Farthing takes third prize: his steer has a good back and full thighs, but with the quality of meat not equal to his competitors. In Class 3, Mr. W. Farthing takes the first place with a superb ox of very deep cylindrical frame, well and evenly-fed, hips but loin rather high, and tail too low, with fine quality of meat, and nice coat. Major-General Hood takes second prize: his ox is of admirable quality, and thickly fed, while he girths well. Mr. J. Tingey takes third prize with a good ox of deep frame and excellent quality of flesh, but not evenly fed; and Mr. J. Paul's excellent ox is highly commended. In the Class of Devon heifers we always look for something truly attractive and beautiful: but, as a whole, we do not think them so handsome as in some former years. Mr. J. Dashwood takes first honours. This heifer comes nearly up to our wishes; but she has a thin neck, and is somewhat defective in rib, loin, and thigh: body too fully out. Mr. W. Farthing takes second prize with a very useful heifer, but defective in her forequarter and unevenly fed. Mr. R. Farthing takes third prize. His heifer is much larger, and well-fed: her defective rumps and high loin disqualifying her for any higher distinction, which otherwise she ought to have had. Mr. J. H. Benjafield's heifer in this class deserves honourable mention for her uniformity. In Class 5, Mr. W. Farthing takes first honour with a very superior cow Pink, of fair proportions, and excellent quality. Mr. R. Farthing takes second prize. This cow, Rosa, is larger than number one, and good in form; hand not quite so good: in other respects she more than equals her fortunate rival. Mr. W. Taylor takes third prize with his Gentle, of nice form and style, but of no such service in the herd as her more successful competitors; and hence probably her place. Mr. J. H. Buller's cow is commended, and very properly, being a capital animal. These cows and heifers may be called pedigree animals, and rejoice in distinguished names well-known in the West.

The *Hereford* classes are not remarkably full, nor good, but they contain meritorious specimens of the breed. In Class 6, there are only three entries; but Mr. R. Shirley maintains his high reputation by again taking a first prize in this class. His steer is of exceedingly good form, deep frame, hips level, but not wide, nice hair, and it seems a pity to kill him. Major-General Hood takes second prize with a capital steer; rather long frame, evenly fed, and good purse. In Class 7, General Hood comes to the fore, and wins with a very useful steer, but no more. Mr. R. Shirley takes second prize with a steer of rather higher order, but with nothing wonderful about him. Mr. H. Bettridge takes third prize with a likely useful steer. Only three entries for the three prizes, and all awarded. Class 8 is of excellent merit, and receives very properly a commendation as a class. Mr. Beach stands at its head with an ox deep in his chest, with a full breast, level fed, and with fair quality of meat. Mr. V. E. Nightingale takes second honour: a good proportionate frame, well and evenly fed, firm hand, capital thighs and twist, but not a thorough "white-face." Mr. W. Heath wins the third prize with an ox that stands high, has a rather long frame, but deep in form; a fine animal; his hind-quarters somewhat slight, or he would have achieved higher distinction. In the heifer class we again look for excelling beauty, nor are we disappointed, except in point of numbers, as only six put in an appearance. Mr. J. H. Arkwright holds first prize; this heifer, Spot, is handsome and in good form, short and compact in make, firm in hand, and evenly fed. Mr. P. Turner takes second prize with Queen of the Vale, a longer-framed but well-formed heifer, and very pretty; of excellent quality, and has had one calf. Mr. J. D. Allen ranks third with Lady Shaftesbury, which has a longer frame, but is nicely fed. Major-General Hood receives a high commendation in this class. Is not a heifer, after her first calf, a young cow? In Class 10 Major-General Hood again comes to the front with a capital old cow, exceedingly well and evenly fed, rejoicing in the name of Sunflower. Mr. H. Bettridge takes second prize with Sally, a heavy, good cow, with capital forequarters and large body, and Mr. J. M. Reed third prize with Lydia, a useful, well-fed cow.

The *Shorthorn* classes scarcely maintain their superiority at this meeting, although the classes are fairly filled. Still, as a lot, the steers and oxen are decidedly below the average, and Mr. Stratton publicly denounced them at the dinner. In Class 11, Leney and Son take first prize. The steer is a good specimen of the breed, of large size for his age, and cylindrical in frame, but he wants more time to make him up. Lord Radnor takes second place with another tolerable steer. In Class 12, Mr. G. Taylor is successful with a beautiful roan, having some of the proportions of an admirable Shorthorn; top superb, but slight flank, and underneath parts require to be more matured. Mr. J. S. Bult's steer takes second honour: he is somewhat defective in rump, hip, and flank, or he ought to have stood first. Mr. W. Shaw's steer stands third: evenly fed, of good size, capital chest, and good forequarter. Mr. E. L. Betts receives a high commendation for his steer by Sixth Duke of Airdrie, and Mr. W. Sisman for his very useful steer. In Class 13 Mr. C. W. Packe receives first honour. His ox, by White Velvet, is a very highly fed animal; but he wants more nobility of character—tremendous weight but plain, very massive frame, exceedingly fat, the brisket and flank defective, hips rather high, short rump, and deep thighs. Mr. R. Wood takes second place with an ox by Britannicus, a more handsome animal, and well-formed throughout; his frame very catching, and of noble appearance; not so heavy, nor such good heavy flesh, and lighter in general proportions. Mr. R. N. Morley takes third prize: a large and capital ox. Mr. W. Heath receives a high commendation with his very fine ox. In Class 14 Mr. R. Stratton very deservedly wins the first prize with his beautiful heifer, Garland. She is nearly perfect in frame; her proportions are very symmetrical and even; a handsome good roan. There may be a little defect at the back of the shoulder, and slight deficiency in the fore-quarter; but her kind and quality are nearly all that can be desired. Lord Faversham takes second honour with Princess, a beautiful heifer, standing on short legs; very full frame and large girth; hips not quite out enough; quality of flesh very good. Princess, like Garland, has been a winner at some of our great breeding shows, but curiously enough Lord Faversham has never had his heifer put to the bull! The third prize goes to a new exhibitor—Sir C. M. Lampson, of Atlantic Telegraph fame. His Rose is a great, if not sweet, beauty; very even and cylindrical in frame. She certainly wants more time, and would, if kept over, form a topper for next Show. Lord Radnor has a high commendation. The heifer Récherché stands rather low, but is of fine form and deep frame. Mr. Swinnerton has a commendation with Lady Alice, a good deeply-framed heifer, with rather short rib, but good quality of meat. There are twelve superior animals in this class of exceedingly fine proportions and quality. In Class 15 we have much that is attractive and profitable—a better class is seldom seen. Mr. R. Stratton's cow, Diadem, stands at the head of it, as well as of all the cows in the yard, taking the first prize and silver cup. She is of very massive frame and full proportions, being one of the finest cows ever exhibited. She is long in frame, but very cylindrical and fully thrown out—girth great; full chest, and breast; and flank and thighs full and broad; rib, as it should be. She is well-fed, very fat, and of excellent quality. Perhaps her hip and loin are too high, but they are well covered: her girth is 9 feet 3 inches. Mr. Lynn, another successful exhibitor, takes 2nd prize with the well-known Pride. She is very evenly fed, and is fair in hand; her hips and rump broad, and tuts large; capital girth—a fine-made, good cow. Mr. C. Leney stands third with his Blush—a handsome, well-formed large cow of good proportions, and highly fed. Messrs. J. and F. Howard receive a high commendation with their famous cow Claret; but she has gone all to pieces. Mr. Garne has a commendation with his cow Jacinth, and Colonel Brise receives a like honour with his cow Scullery Girl—both most creditable specimens of Shorthorns.

Having travelled rather elaborately through the three popular breeds of the kingdom, we must now pass more rapidly over the remaining classes. Of these 16, 17, 18, and 19 are for the *Sussex* breed. We seldom saw a better exhibition of these cattle; they are improving greatly, but there is still too much length of frame in proportion to depth and breadth of form. Mr. J. Napper's prize ox is a capital beast, but has too much of the usual characteristics of the breed, a narrowness of frame, and the absence of that touch which shows inclination for rapid fattening. The *Suffolks and Norfolks* are fairly represented, with some of the specimens unusually handsome and good, showing more depth of frame, and excellence in quality of meat. The *Long-horn* classes are more sparingly filled, only four animals competing, but they are of high order, and their quality of flesh fully equal to any in the show, taking lean meat as intermingled with fat. The *Scotch-horn* classes have some good animals; the Duke of Sutherland's ox has a tremendous depth of frame, but is not very fat; while Mr. Stewart's prize ox is exceedingly good, as is also Mr. Crawley's cow. The *Polled Scots* classes possess some most extraordinary animals in the Hall. The late Sir A. L. Gordon Cumming's ox is of very immense proportions, so uniform and full, with a wonderful back; while he stands very high, is very long in frame, and of vast weight, his girth 9 feet 6 inches, and his meat firm and good. Mr. W. M'Combie's second is nothing like so clever. The *Welsh* classes are scant, but Mr. Henry Platt's ox is in almost perfect contour of form, so uniform in fatting and so firm in flesh, beyond most others; as Lord Penrhyn's ox takes after him; and Major Hayward's, if not handsome, is very deep in frame, and the quality of his meat exceedingly good. The *Cross-breed* classes are famously filled. In these, indeed, are a few wonderful animals. The Gold Cup winner, the property of Mr. R. H. Heath, of Forres, Morayshire, is of astonishing proportions, and almost without a fault. His general contour of frame is remarkably full in every part, even to his very ears; and his girth, 10 feet 2 inches, rivals the celebrated Durham ox. His quality of flesh is superior, but not equal to some others; while in appearance he takes all after the Shorthorn. Mr. P. Beattie's heifer is beautifully formed, and of excellent flesh, as is also Mr. Moir's. The *Extra Stock* classes comprise some excellent animals. Mr. W. Farthing's ox is a beautiful Devon, of a superior quality of meat; and Mr. J. M. Read's cow is one of the best in form and most evenly-fed animals in the Show, as well as firm hand. A little Bretonne steer is in this class, just serves to show how unprofitably we may breed.

In speaking of the sheep classes, we may premise a remark or two. Is it not right to support those breeds which have attained a high character and stand as established types, rather than to continue aiming at something new, or to go on recommending those of inferior order and imperfect in form ? Here are our classes : *Leicesters, Cotswolds, Lincolns, Kentish* or *Romney Marsh,* other *Long-wools, South Downs, Hampshire* or *Wiltshire Downs, Shropshires, Oxfordshires, Mountain, Ryelands, Cheviots, Dorsets,* and *Cross-breeds.* Are all these varieties worthy the high distinction conferred upon them by liberal prizes from the Smithfield Club ? We should prefer more prizes or honours for the best breeds, of which it has seldom been our privilege to go over a better show. The classes of South Downs were never seen in finer condition or in higher order of beauty than at the present meeting ; they are superb as a whole, and in goodly number. The Leicesters and Long-wools are not quite so good nor equal to some former years. The Hampshire and Wiltshire Downs are short in numbers, and the Shropshires moderate in most ways. The Oxfordshire Downs were well represented, at least for quality ; while the Mountain breeds evidenced the most marked improvement of any of the sheep classes. The Rylands and Cheviots were of no very commendable character. In class 35, *Leicesters,* Lord Berners takes the first prize, as also the silver cup, as the best pen in the long-woolled classes. They are a very bloodlike lot, with full, deep, well-formed frames, capital plaits and chests, good rumps, and broad fat backs; wool perhaps a little too light, and varying in staple and quality, and altogether light sheep. Mr. G. Walmsley takes second prize with a pen of exceedingly good sheep, but not so perfect as the above, either in form or hand; but with wool more alike, and much greater weight. Mr. W. Browne receives the third prize with sheep of larger frames, but of excellent character and hand ; wool rather thinly set. In Class 36 Lord Berners is again successful in carrying off the first prize. These are rather short but with full frames, nice backs, good plaits, short rumps, more level in their fleeces, and of heavier wool. Mr. C. J. Bradshaw takes second prize with a pen of very useful sheep, but not compact enough in frame. There did not seem to be much system in judging the Leicesters, small and large having in turn the call. Class 37, *Cotswolds:* Only four pens ! Mr. Wigmore takes first honours, and richly merits them: we have seldom seen a better pen of this breed, at the age, with backs and hand equal to the best Leicester; fine handsome looks, great depth of frame, large in size, and full of mutton and good wool. These sheep were at Birmingham, where we spoke to their remarkable uniformity. Messrs. G. and T. West take second prize: they are longer-framed sheep, of great weight; wool long and good; hand not equal to the first lot. Mr. J. K. Tombs receives third prize, with a very good pen, but unequal; one of them is a very fine sheep—a good class, though so small. Class 38, *Lincolns:* Only two pens ! Mr. John Edwards takes first prize with a very nice lot, They have great length and depth of frame, neat heads and looks, prime good mutton, light offal, plenty of good wool. Mr. J. Pears takes second prize with a good pen, nearly equal to the above, and with better rumps and thighs. *Kentish, orRomney Marsh,* Class 39: Only two pens! Mr. F. Mufton, who usually stands well in this class, is again awarded first honour. These pens we could not take to be pure-bred Kents : if so, they must have wonderfully improved in character of late. Mr. Murton's lot have good contour of frames, well fatted, heavy wool, heads coarse, and ears long. Mr. M. Cox takes second prize. This pen denotes a cross even more than the others : they are very useful, fair-formed sheep. Class 40, *any other long wools:* Mr. J. Edwards again comes to the front and receives first prize with a Lincoln and Leicester pen, exceedingly well fed and with good fleeces. Mr. J. Newman takes two prizes with a very useful pen. We now come to the gems of the show—the pure Southdowns. Class 41, Lord Walsingham takes first here, as also the silver cup, as the best pen in the short-woolled classes. They are very beautiful, full and perfect in frame, of true symmetrical proportions, of great size, exceedingly well and evenly fed, hand firm, nice countenances, wool fine and thick-set, likely to yield well—though with one face a little too dark. Lord Sondes is awarded second honours, with a beautiful pen, exceedingly well got up, chines broad, and well-formed of good wool. Lord Radnor takes third prize. These have longer frames, but well-formed heads, rather large, but correct in colour; good thighs, wool fair. Mr. H. H. Penfold receives a high commendation with an excellent pen, but not so perfect in form as the Peers' pens. Necks rather long and thin, ears short, chine and chest too narrow; but well fed. In Class 42 Lord Walsingham is again first; his first-prize pen are beautiful types of the larger Downs. They are quite as symmetrical as his Lordship's other lot, with better thighs and quality of meat unsurpassed. Lord Sondes is again in the second place. This pen has longer frames and necks, ears too short, chine too narrow, fine-quality mutton, and fair wool. Mr. G. L. Foljambe takes third prize. This is a pen of very useful sheep, longer in frame, but of fair depth, and well fed. Lord Radnor receives a "high commendation" with a superior lot, of like character to those of his lordship's just named. In Class 43 the Goodwood flock once again comes to the front, and the Duke of Richmond takes the first place with a very splendid pen: we have seldom seen one so good. Their fatting has been done to perfection as to quality of meat, but not altogether uniform. They are somewhat long in frame; necks, chines and shoulders, and plaits are, if anything, a little scant; their backs, rumps, loins, thighs, flanks, very good. Lord Walsingham takes second prize with a wonderful pen, each animal so good both in frame and form—not so long, but more compact than the Duke's, and with rumps, loins, backs, plaits, chests, and necks superior; but they are not uniform in size. One is an extraordinary sheep for depth of chest and breadth of plaits and bosom. Lord Radnor has third with a pen of larger and longer-framed sheep, but not so deep and compact in form: fair rumps, and quality undeniable. Mr. W. Rigden, we are happy to see, receives a commendation for a very good pen. We yet, in this entry, observe samples of the old distinctions in these flocks—the somewhat long frames, but thorough-bred looks, of the Duke of Richmond's, Lord Radnor's, Lord Sondes', and Mr. Foljambe's flocks, and the more massive and compact frames of Lord Walsingham's, Mr. Rigden's, and the Webb tribe.

Having been somewhat particular in our remarks upon the more popular and older-established breeds, we must be more concise upon the remaining classes. *Hampshire and Wiltshire Downs:* We sometimes wonder why these Downs are so preferred to the Southdown. They are ungainly-formed animals as a class; we may like their size, but not their shape. They are not in great force this year. In Class 44 we have the lot of Mr. S. King taking first with a pen of large long-framed sheep with good level backs, fair plaits, long necks, thick heads, and queer looks, but firm hand, wool good; Col. Loyd Lindsay taking second prize with a similar lot, and still worse looks. Mr. W. B. Canning has third prize, and Messrs. J. and M. Arnold receive a commendation. The Shropshires, again, are by no means in any imposing display; while they are often trimmed and touched-up to a very absurdity. In Class 45, Lord Chesham takes first honours with three very fine, well-formed sheep, handsome, full of mutton and wool, both of superior quality. Mr. H. Smith takes second prize with his Birmingham pen, having good broad, fat backs upon well-formed frames. Mr. J. Beach takes third prize; but as a whole this is a moderate class. In Class 46 there is only one competitor, Mr. H. Smith, who takes first prize with a splendid pen, almost equal to any in the show for perfect contour of frame and general appearance, so well-formed and thrown out in every part. One sheep is particularly large and good. *Oxfordshires:* Class 47, only six entries. Mr. S. Druce takes first prize with very good sheep indeed, possessing much mutton, and exceedingly well fed. The Duke of Marlborough takes second prize: these are very compact; wool thick-set, and mutton good. Mr. S. Freeman takes third prize with a similar lot, having rather more wool. Mr. A. Rogers receives a high commendation; and Mr. A. M. Mumford and Mr. F. Street receive commendations; so that, as at Birmingham, every one of the Oxfords receives a compliment of some kind from the judges. *Mountain Sheep:* No class has met with greater improvement than this. In Class 48, Mr. J. Tapp wins first prize with a prime lot of Exmoors: they are large of the sort—about the size of average Leicesters, good in form, fat and firm, and with plenty of wool. Mr. W. Smith takes second prize with a very similar lot of equal quality. In Class 49, Mr. J. Peel takes first honour with a pen of very large pure Lonks, weighing nearly 40lbs. per quarter. They look regular mountain-climbers for length and activity; and their feeding is admirable. Mr. J. McGill takes second prize with a very singular pen of cross-bred sheep, apparently by a Lincoln ram on a Scotch mountain ewe. There is much long wool; a good-formed, large-framed sheep, of good quality of mutton, with apparent activity enough for hilly districts. *Ryelands, Cheviots, and Dorsets:* In Class 50, Mr. J. B. Downing takes first prize with a good pen of fairly-formed sheep; Mr. McGill takes second prize with a pen of pure Cheviots—just the animals for right down cold weather and rough living. In Class 51, *Cross-bred Sheep,* Mr. John Overman wins 1st prize and the Silver Cup with his pen of Leicester and Southdowns. These sheep as a lot are decidedly the best-formed and most complete animals in any of the modern-breed classes. They are large, fine forms, well made up to exceeding quality, and have much wool. Mr. Z. W. Stilgoe takes 2nd prize, and Mr. J. White 3rd prize. There is a capital sheep in this pen. In Class 52, Mr. John Overman once more comes to the fore, and wins with another pen similar to his lot above-named: Mr. George Hine takes second prize. We will now go shortly through the *Extra-Stock Sheep.* In the Leicester wethers, Mr. G. Walmsley takes the Silver Medal with a very superior sheep, exceedingly handsome; thick, finely-moulded frame; well and evenly fatted; excellent quality; nice wool. In Leicester ewes, Mr. C. J. Bradshaw takes the Silver Medal. This ewe is quite a model of her breed—beautiful in form, very highly fed, and has good rumps and plaits. In other long-woolled sheep, not Leicesters, Mr. J. H. Casswell takes the Silver Medal with an extraordinary ewe of the finer class of Lincoln longwools. Her frame is wonderfully filled out in every part but the rump, which is somewhat short; back, loin, and plaits exceedingly good; her girth, 6ft. 7in.; mutton rather loose. Mr. J. Edwards receives a commendation with a Lincoln wether of very commendable character. Southdown wethers: Mr. G. S. Foljambe takes the Silver Medal with his wether, having a beautiful rather small frame and fine mutton. The Duke of Richmond receives a high commendation in the same class. Southdown ewes: In this class Lord Sondes takes the Silver Medal with his pretty little ewe, the most perfect in frame and beauty amongst the Southdowns, as she cannot be excelled in quality of mutton. Mr. G. S. Foljambe receives a high commendation with a beautiful larger-framed ewe, not so complete as that of Lord Sondes, but a more profitable breeder. In other Short-wools not Southdowns Mr. G. Wallis takes the Silver Medal with his Oxfordshire Down, a very useful sheep, but not in perfect form. Mr. J. Tapp receives a high commendation with another of his capital Exmoors. Mr. S. King has also a high commendation with his West-country wether, and Mr. N. B. Canning a like honour with his Hampshire Down. In the cross-bred sheep class, Mr. John Overman takes the Silver Medal with another of his Leicester and Down sheep.

The pigs prove, upon examination, a very moderate lot; and, unmistakeably, the least improving section of the show. In Class 53, we begin with Captain R. P. Warren's third-prize pen, which are good models of the small breed, with fine hair. Mr. Underwood's first-prize pen are much larger, and of nearly equal quality, with very compact pretty frames, and well fed; hair rather thin, but strong. Mr. Mitchell's second-prize pen have much thicker frames, deep sides, broad backs, capable of fatting to great weights; hair stiff, and rather long. Major-General Hood's highly-commended pen have very pretty frames, and are good in quality. Mr. Slade's highly-commended pen are exceedingly small, like bantams in our poultry classes; very pretty, and would make good roasters. Mr. Melville Cartwright's first prize pen, in Class 54, shows a good heavy-fleshed trio, of good quality, and thick in form, with nice hair. The Earl of Radnor's third-prize pen are longer in frame, and rather coarse in quality of flesh and hair. Mr. Biggs, second-prize pen have much thicker frames, deep in form and look like good bacon pigs. Mr. Underwood's highly-commended pen are very good, rather loose hand and light hair; while Major-General Hood's are well fed, with thick short frames, good form, and thin long hair. In Class 55, the first prize is won by Mr. C. Cattle, who has long stood well as a first-class breeder of pigs: he shows a nice pen, having capital frames, well fed up, with good quality of flesh, necks and chests full, broad backs, and deep sides, hair long and nicely set. Capt. R. P. Warren takes the second prize with a pen of deep-formed pigs, of longer frames, good backs, and full thighs, and quality of flesh fine. The third prize is taken by Mr. G. M. Sexton with a pen of broad-framed pigs of nice length and depth, with good necks, and fed-up to their snouts like many others exhibited. Mr. Mainwaring's highly commended pen are a very nice, compact lot; level backs, well fatted, thin, fine, long hair. Mr. J. Biggs' commended pen are a lot of heavy pigs, long in frame but well filled out, hair long and thin. In Class 56 Mr. Coate, of Hammoon, of long-established repute, takes first prize and silver cup, with a lot of big plain pigs; but their flesh is flabby, and their hair short and patchy. There have been often far better "firsts and firsts;" and had Mr. King Tombs' three been "all in" he should have won. The second prize goes to Lord Radnor, who has long stood before us as a first-class breeder. His pen match each other well; frames rather long, but deep and broad; though they are far behind what Coleshill has done in this way. The third prize is taken by Mr. J. P. King with a heavy lot, but somewhat coarse in quality. They have long, good frames, and are also excellent bacon pigs; supposed weight "25 scores." Mr. G. M. Sexton's highly commended pen, larger and longer, are well fed but not of fine quality. Mr. Walter's are roughish profitable pigs, not highly fed, hair thick and coarse. In the Extra Class there are several good pigs. Mr. Stearn takes the silver medal in this class with the most evenly-formed pig in the show, and of excellent quality; as we spoke to his merits at Birmingham. Mr. J. H. Clarke's highly commended pig is almost too long in form, and of rather coarse quality; while Mr. Saunders's commended pig is a good fat animal for bacon. Lord Radnor's commended pig is similar in frame, but of better quality. Messrs. J. and F. Howard's sow of the large Yorkshire breed is very long in frame, but not proportionate in breadth and depth of form—a family failing, undoubtedly, with many of the larger sorts.

The trade, more particularly during the earlier part of the week, was dull, and beasts were making better prices out of the Hall than in it. Still, a great number of animals were sold at some price, and sheep and pigs more briskly, when it was known that the slaughtering restriction did not apply to these classes; but the butchers had on the whole the business pretty much their own way.

AWARD OF PRIZES.

LIST OF JUDGES, 1866.

DEVON, HEREFORD, SUSSEX, NORFOLK OR SUFFOLK, LONGHORN, IRISH AND CROSS, OR MIXED-BRED CATTLE.

J. Buckley, The Cottage, Loughborough.
John Moon, Maristow, Roborough, South Devon.
R. J. Newton, Camsfield, Woodstock, Oxon.

SHORTHORN, SCOTCH, AND WELSH CATTLE.

Francis Fowler, Henlow, Biggleswade, Beds.
Richd. Milward, Thurgarton Priory, Southwell.
J. B. Thompson, Anlaby, Hull.

LEICESTER, COTSWOLD, LINCOLN, KENTISH OR ROMNEY MARSH, OTHER LONGWOOL, CROSS-BRED, OXFORD, AND MOUNTAIN SHEEP.

Robt. Garne, Aldsworth, Northleach.
George Mann, Scawsby Hall, near Doncaster, Yorks.
John Painter, Forest-road, Nottingham.

SOUTHDOWN, HAMPSHIRE OR WILTSHIRE, SHROPSHIRE, RYELAND, CHEVIOT, AND DORSET SHEEP.

John Claydon, Littlebury, Saffron Walden.
C. Randell, Chadbury, Evesham.
J. S. Turner, Chington, Seaford, Sussex.

PIGS.

John Brown, Uffcott, Swindon, Wilts.
A. F. M. Druce, Burghfield, Reading, Berks.
John Slater, North Carlton, near Lincoln.

CATTLE.

DEVONS.

Steers, not exceeding 2 years and 6 months old.

First prize of £20, to J. Overman, Burnham Sutton, Norfolk.

Second of £10, to Wm. Smith, Higher Hoopern, Exeter, Devon.

Steers, not exceeding 3 years and 3 months old.

First prize of £30, to T. Bond, North Petherton, Bridgewater, Somerset.

Second of £20, to W. Smith, Higher Hoopern, Exeter, Devon.

Third of £10, to W. Farthing, Bridgewater, Somerset.

Steers or Oxen, above 3 years and 3 months old.

First prize of £30, to W. Farthing, Bridgewater, Somerset.

Second of £20, to Major-General the Hon. A. N. Hood, Windsor.

Third of £10, to J. Tingey, Ellingham, Attleborough, Norfolk.

Highly commended.—J. P. Paul, Newclose, Yarmouth, Isle of Wight.

Heifers, not exceeding four years old.

First prize of £25, to J. Dashwood, Ryde, Isle of Wight.

Second, of £15, to W. Farthing, Bridgewater, Somerset (Duchess).

Third, of £10, to R. Farthing, North Petherton, Somerset.

Cows, above four years old.

First prize of £25, to W. Farthing, Bridgewater, Somerset (Pink).

Second, of £15, to R. Farthing, North Petherton, Somerset (Rosa).

Third, of £10, to W. Taylor, Bristol, Somerset (Gently).

Commended.—J. H. Buller, Downes, Devon.

HEREFORDS.

Steers not exceeding 2 years and 6 month old.

First prize of £20, to R. Shirley, Baucott Munslow, Church Stretton, Salop.

Second prize of £10, to Major-General the Hon. A. N. Hood, Windsor.

Steers not exceeding 3 years and 3 months old.

First prize of £30, to Major-General the Hon. A. N. Hood, Windsor.

Second prize of £20, to R. Shirley, Baucott Munslow, Church Stretton, Salop.

Third prize of £10, to H. Bettridge, East Hannay, Wantage, Berks.

Steers, or Oxen, above 3 years and 3 months old.

First prize of £30, to J. Beach, Brewood, Stafford.

Second prize of £20, to V. E. Nightingale Burway, Ludlow, Salop.

Third prize of £10, to W. Heath, Ludham Hall, Norwich, Norfolk.

Commended.—Class generally.

Heifers, not exceeding 4 years old.

First prize of £25, to J. H. Arkwright, Leominster, Herefordshire (Spot).

Second prize of £15, to P. Turner, Pembridge, Leominster, Hereford (Queen of the Vale).

Third pize of £10, to J. D. Allen, Tisbury, Salisbury (Lady Shaftesbury).

Highly commended.—Major-General the Hon.A. N. Hood, Windsor (Constance).

Cows above 4 years old.

First prize of £25 to Major-General the Hon. A. N. Hood, Windsor (Sunflower).

Second of £15 to H. Bettridge, East Hannay, Wantage, Berks (Salles).

Third of £10 to J. M. Read, Elkstone, Cheltenham (Lydia).

SHORTHORNS.

Shorthorned Steers, not exceeding 2 years and 6 months old.

First prize of £20, to F. Leney and Son, Wateringbury, Kent.

Second prize of £10, to Earl of Radnor, Highworth.

Steers, not exceeding 3 years and 3 months old.

First prize of £30, to G. Taylor, Bridlington Quay, York.

Second prize of £20, to J. S. Bult, Kingston, Somerset.

Third prize of £10, to W. Shaw, Far Coton, Northampton.

Highly commended.—E. L. Betts, Aylesford, Kent.

Commended.—W. Sisman, Kimbolton, Huntingdon.

Steers or Oxen, above 3 years and 3 months old.

First prize of £30, to C. W. Packe, M.P., Prestwold, Loughborough, Leicester.

Second prize of £20, to R. Wood, Clapton, Thrapston, Northampton.

Third prize of £10, to R. N. Morley, Leadenham, Grantham, Lincoln.

Highly commended.—W. Heath, Ludham Hall, Norwich.

Heifers, not exceeding 4 years old.

First prize of £25, to R. Stratton, Walls Court, Bristol, Gloucester (Garland).

Second prize of £15, to Lord Feversham, Duncombe Park, Helmsley, York (Princess).

Third prize of £10, to Sir C. M. Lampson, Bart., Rowfant, Crawley, Sussex (Rose).

Highly commended.—Earl of Radnor, Coleshill, Highworth (Recherche); and T. Ferris, Manningford Bohurne, Marlborough.

Commended.—R. Swinnerton, Nuneaton, Warwick.

Cows, above 4 years old.

First prize of £25, to R. Stratton, Walls Court, Bristol, Gloucester (Diadem).

Second of £15, to J. Lynn, Stroxton, Grantham (Pride).

Third of £10, to C. Leney, Leavers, near Hadlow (Blush).

Highly commended.—J. and F. Howard, Bedford (Claret).

Commended.—T. Garne, Broadmoor, Northleach, Gloucester (Jacinth); and Col. Brise, Spain's Hall, Braintree, Essex (Scullery Girl).

SUSSEX.

Sussex Steers or Oxen, not exceeding 3 years old.

First prize of £20, to J. and A. Heasman, Angmering, Arundel, Sussex.

Second prize of £10, to L. Steere, Dorking, Surrey,

Steers or Oxen, above 3 years old.

First prize of £25, to J. Napper, Wisboro' Green, Horsham, Sussex.

Second prize of £15, to G. C. Coote, Tortington, Arundel, Sussex.

Third prize of £10, to W. Sturt, Fetcham, Leatherhead, Surrey.

Heifers, not exceeding 4 years old.

First prize of £20, to J. Shoosmith, Berwick, Lewes, Sussex (Lauret).

Second prize of £15, to G. C. Coote, Tortington, Arundel, Sussex.

Cows above 4 years old.

First prize of £20, to J. and A. Heasman, Angmering, Arundel (Spot).

Second of £15, to G. Jenner, Udimore, Rye, Sussex (Mayflower 3rd).

NORFOLK OR SUFFOLK POLLED.

Polled Steers or Oxen, of any age.

First Prize of 15*l.* to T. M. Hudson, Castleacre, Brandon, Norfolk.

Second Prize of 10*l.* to D. Walker, Pauxworth, Norwich, Norfolk.

Polled Heifers or Cows, of any age.

First prize of £15, to W. Postle, Norwich.

Second prize of £10, to Lord Sondes, Eltham Hall, Thetford, Norfolk.

LONGHORNS.

Steers or Oxen, of any age.

First prize of £10, to R. H. Chapman, Upton, Nunheaton, Warwick.

Second of £5, to Sir J. Harpur Crewe, Bart., Calke Abbey, Derby.

Heifers or Cows of any age.

First prize of £10, to R. H. Chapman, Upton, Nuneaton, Warwick (Lady Cheesepan).

Second of £5, to Sir J. H. Crewe, Bart., Calke Abbey, Derby (Broodhead 3rd).

SCOTCH-HORNED.

Steers or Oxen of any age.

First prize of £30, to J. Stewart, 1 and 2, New Market, Aberdeen.

Second of £15, to the Duke of Roxburgh, Kelso, Roxburgh.

Heifers or Cows of any age.

First prize of £15, to J. S. Crawley, Stockwood, Luton, Bedford (Stonefield).

Second of £10, to the Duke of Sutherland, Dunrobin Castle, Sutherland (Kate).

SCOTCH POLLED.

Steers and Oxen, of any age.

First prize of £30, to The Executors of the late Sir A. P. Gordon Cumming, Bart., of Altyre, by Forres, Moray.

Second of £15, to W. McCombie, Tillyfour, Aberdeen, N.B.

Highly commended, J. Stephens, Conglass, near Aberdeen; commended, E. Ling, North Repps, Norwich, and The Duke of Grafton, Thetford, Norfolk.

Heifers or Cows, of any age.

First prize of £15, to J. Reid, Graystone, Alford, Aberdeenshire.

Second of £10, to The Duke of Buccleuch and Queensbury Tibbers, Thornhill, Dumfries.

IRISH.

Steers or Oxen, of any age. [No entry.]
Heifers or Cows of any age. [No entry.]

WELSH.

Steers or Oxen (Runts) of any age.

First prize of £20, to H. Platt, Bryn-y-Newadd, Bangor,, Carnarvon.

Second prize of £10, to the Right Hon. Lord Penrhyn, Penrhyn Castle, Bangor.

Heifers or cows, of any age. [No entry.]

CROSS OR MIXED-BRED.

Steers, not exceeding 3 years old.

First prize of £25, to J. Stewart, 1, 2, and 3, New Market, Aberdeen (Shorthorn and Aberdeen Polled).

Second of £15, to J. K. Farthing, Currypool, Charlynch, Somerset (Devon and Guernsey).

Third of £10, to R. Moir, Meikle Tarty, Ellon (Aberdeen and Shorthorn).

Steers or Oxen, above 3 years old.

First prize of £25 to R. Harris, Earl Hill, Forres, Morayshire (Shorthorn and Scotch Polled).

Second prize of £15 to W. Scott, Glenronach, Huntley, Aberdeen (Shorthorn and Scotch Polled).

Third prize of £10 to J. and W. Martin, Aberdeen (Shorthorn and Polled).

Highly commended, J. Napper, Wisboro' Green, Horsham, Sussex (Devon and Sussex).

Heifers, not exceeding 4 years old.

First prize of £20, to P. Beattie, Dunnydeer, Insch, Aberdeen (Shorthorn and Polled).

Second of £10, to R. Moir, Meikle Tarty, Ellon (Shorthorn and Aberdeen).

SHEEP.

LEICESTERS.

Fat Wethers 1 year old, under 23 months.

First prize of £20, to Lord Berners, Keythorpe, Leicester.

Second of £15, to G. Walmsley, Bridlington, Yorkshire.

Third of £5, to W. Browne, Home-on-Spalding Moor, York.

Fat Wethers, 1 year old, under 23 months. Each Sheep not to exceed 220lbs. live weight.

First prize of £20 to Lord Berners, Keythorpe, Leicester.

Second of £15, to C. J. Bradshaw, Burley-on-the-Hill, Rutland.

Commended.—G. S. Foljambe, Worksop, Nottinghamshire.

COTSWOLDS.

Fat Wethers 1 year old, under 23 months.

First prize of £20 to J. Wigmore, Much-Marcle, Hereford

Second of £15, to T. and G. West, Bletchington, Oxon.

Third of £5, to J. K. Tombs, Langford, Lechdale, Gloucester.

LINCOLNS.

Fat Wethers 1 year old, under 23 months.

First prize of £20, to J. Edwards, Buckworth, Huntingdonshire.

Second of £15, to J. Pears, Mere Branston, Lincoln.

KENTISH OR ROMNEY MARSH.

Fat wethers 1 year old (under 23 months.)

First prize of £15 to F. Murton, Smeeth, Kent.

Second of £10 to M. Cox, Waltham, Kent.

ANY OTHER LONG-WOOLS.

Fat Wethers, not being Leicesters, Cotswolds, Lincolns, or Kentish, 1 year old (under 23 months.)

First prize of £15 to J. Edwards, Buckworth, Huntingdonshire (Lincoln and Leicester).

Second of £10 to J. Newman, Harrowden, Bedford.

SOUTHDOWNS.

Fat Wethers, one-year old (under 23 months.)

First Prize of 20*l.* to Lord Walsingham, Thetford, Norfolk.

Second Prize of 10*l.* to Lord Sondes, Thetford, Norfolk.

Third Prize of 5*l.* to Earl of Radnor, Highworth.

Highly Commended.—H. H. Penfold, Chichester, Sussex.

Fat Wethers, one-year old (under 23 months), each Sheep not to exceed 200 lbs. live weight.

First Prize of 15*l.* to Lord Walsingham, Thetford, Norfolk.

Second Prize of 10*l.* to Lord Sondes, Thetford, Norfolk.

Third Prize of 5*l.* to G. L. Foljambe, Worksop, Nottingham

Highly Commended Earl of Radnor, Highworth.

Fat Wether, 2 years old (above 23 and under 35 nonths.)

First prize of £20, to the Duke of Richmond, Goodwood, Sussex.

Second prize of £10, to Lord Walsingham, Thetford, Norfolk.

Third prize of £5 to the Earl of Radnor, Highworth.

Commended.—W. Rigden, Hove, Sussex.

HAMPSHIRE OR WILTSHIRE DOWNS.

Fat Wethers, 1 year old (under 23 months).

First prize of £20, to S. King, Bockhampton, Berks.

Second prize of £15, to Colonel Loyd Lindsay, M.P., Lockinge, Berks.

Third prize of £5, to W. B. Canning, Elston, Wilts.

Commended.—J. and M. Arnold, Westmeon, Hants.

SHROPSHIRES.

Fat Wethers, 1 year old (under 23 months).

First prize of £20, to Lord Chesham, Latimer Chesham, Bucks.

Second prize of £10, te H. Smith, Sutton Maddock, Shropshire.

Third prize of £5, to J. Beach, Brewood, Stafford.

Fat Wethers, 2 years old (above 23 and under 35 months).

First prize of £15, to H. Smith, Sutton Maddock, Shropshire.

Second prize of £5 (no competition.)

OXFORDSHIRES.

Fat wethers, 1 year old (under 23 months).

First prize of £20, to S. Druce, Eynsham, Oxon.

Second prize of £15, to The Duke of Marlborough, Blenheim, Oxon.

Third prize of £5, E. Freeman, Chilton, Oxon.

Highly commended.—A. Rogers, Bromham, Bedford.

Commended.—J. A. Mumford, Thame, Oxon; and F. Street Bromham, Bedford.

MOUNTAIN.

Fat Wethers, of any White-faced Mountain breed, of any age.

First prize of £15, to J. Tapp, Twitchen, Devon (Exmoor).

Second prize of £10, to W. Smith, Higher-Hoopern, Devon.

Fat Wethers, of any Black-faced or Speckle-faced Mountain breed, of any age.

First prize of £15, to J. Peel, Knowlmere, Clitheroe (Sark).

Second prize of £10, to J. M'Gill, Rotchell, Dumfries (Speckleface).

RYELANDS, CHEVIOTS, AND DORSETS.

Fat Wethers.

First prize of £15, to J. B. Downing, Holme Lacey, Hereford.

Second prize of £10, to J. M'Gill, Rotchell, Dumfries.

CROSS-BRED.

Long and Short-woolled Cross-bred fat Wethers, 1 year old (under 23 months.)

First prize of £20, to J. Overmann, Burnham Sutton, Norfolk (Leicester and Southdown).

Second prize of £15, to Z. W. Stilgoe, near Banbury (Cotswold and Oxford).

Third prize of £5, to J. White, Rickmansworth, Herts (Cotswold and Devon).

Commended.—G. Hine, jun., Oakley, Bedford (Down and Leicester).

Long and Short-woolled Cross-bred fat Wethers, 1 year old (under 23 months.) Each Sheep not to exceed 220lbs. live weight.

First prize of £10, to J. Overmann, Burnham Sutton, Norfolk (Leicester and Down).

Second prize of £5, to G. Hine, jun., Oakley (Oxford and Leicester).

PIGS.

Pigs of any breed, not exceeding 6 months old.

First prize of £15, to J. A. W. Underwood, Warmington, Northampton.

Second prize of £10, to J. Mitchell, Iver, Middlesex.

Third prize of £5, to Captain R. P. Warren, Basingstoke, Hants.

Highly commended.—Major-General Hood, Windsor, Berks, and A. F. Slade, Chislehurst, Kent.

Of any breed, above 6 and not exceeding 9 months old.

First prize of £15, to T. L. Melville Cartwright, Fife.

Second prize of £10, to J. Biggs, Cublington, Beds.

Third prize of £5, to Earl of Radnor, Highworth.

Highly commended.—J. A. W. Underwood, Warmington, Northampton; and Major-General Hood, Windsor.

Of any breed, above 9 and not exceeding 12 months old.

First prize of £15, to C. Cattle, Bawtry, Yorkshire.

Second prize of £10, to Captain R. Pelham Warren, Basingstoke, Hants.

Third prize of £5, to G. M. Sexton, Wherstead Hall, near Ipswich, Suffolk.

Highly commended.—A. Mainwaring, Worting, Basingstoke.

Commended.—J. Biggs, Cubbington, Beds.

Of any breed, above 12 and under 18 months old.

First prize of £15, to J. Coate, Hammoon, Dorset.

Second prize of £10, to Earl of Radnor, Highworth.

Third prize of £5, to J. P. King, North Stoke, Berks.

Highly commended.—G. M. Sexton, Wherstead Hall, near Ipswich.

GOLD MEDALS.

Gold Medal to the breeder of the best Steer or Ox in any of the classes, to A. Cowie, Crombly, Bank-Ellon, Aberdeen.

Gold Medal to the breeder of the best Heifer or Cow in any of the classes, to R. Stratton, near Bristol.

SILVER CUPS.

Silver Cup, value £40, to the exhibitor of the best Steer or Ox in any of the classes, to R. H. Harris, Earn Hill, Forres, Morayshire, for Cross-bred Ox.

Silver Cup, value £40, to the exhibitor of the best heifer or cow in any of the classes, to R. Stratton, near Bristol, for Shorthorn Cow.

Silver Cup, value £20, to the exhibitor of the best pen of Leicesters, Cotswolds, Lincolns, Kentish, or other Long-woolled breed, in any of the classes, to Lord Berners, Keythorpe, near Leicester, for Leicester.

Silver Cup, value £20, to the exhibitor of the best pen of one year old Southdowns, Hampshire or Wiltshire Downs, to Lord Walsingham, near Thetford, Norfolk, for Southdowns.

Silver Cup, value £20, to the exhibitor of the best pen of Shropshire, Oxfordshire, cross-bred, or any other breed of sheep (not specified in the prize list) in any of the classes, to J. Overman, Burnham Sutton, Norfolk, for Crossbreds.

Silver Cup, value £20, to the exhibitor of the best pen of Pigs in any of the classes, to J. Coate, Hammoon, Dorset.

EXTRA STOCK.

Silver Medal, to the exhibitor of the best Steer or Ox in extra stock, and £5 prize, to W. Farthing, near Bridgewater, Somerset (Devon).

Silver Medal, to the exhibitor of the best Heifer or Cow in extra stock, and £5 prize, to J. M. Read, Elkstone, Cheltenham (Hereford).

Silver Medal, to the exhibitor of the best Leicester Wether Sheep in extra stock, to G. Walmsley, near Bridlington, Yorkshire (Leicester). Commended: W. Browne, Holme-on-Spalding-Moor, York (Leicester).

Silver Medal, to the exhibitor of the best Leicester Ewe in extra stock, to C. J. Bradshaw, Burley-on-the-Hill, Rutland.

Silver Medal, to the exhibitor of the best Longwoolled Sheep (not Leicester) in extra stock, to J. H. Casswell, Haughton, Lincolnshire (Lincoln). Commended: J. Edwards, Buckworth, Huntingdonshire (Lincoln).

Silver Medal, to the exhibitor of the best Southdown Wether Sheep in Extra Stock, to G. S. Foljambe, Worksop, Nottingham. Highly commended.—The Duke of Richmond, Goodwood, Chichester.

Silver Medalf, to the exhibitor of the best Southdown Ewe in Extra Stock, Lord Sondes, Thetford, Norfolk. Highly commended.—G. S. Foljambe, near Worksop, Nottingham.

Silver Medal, to the exhibitor of the best Short-woolled Sheep (not Southdown) in Extra Stock, to G. Wallis, Old Shifford (Oxford). Highly commended.—J. Tapp, Twitchen, Devon; S. King, Bockhampton, Berks; and N. B. Canning, Elston, Wilts.

Silver Medal, to the exhibitor of the best Cross-bred Sheep (long and Short-woolled Cross) in Extra Stock, to J. Overman, Burnham Sutton, Norfolk.

Silver Medal, to the exhibiter of for the best Pig in Extra Stock, to S. G. Stearn, Brandeston, Suffolk. Highly commended.—C. Cattle, near Bawtry, Yorkshire; J. H. Clark, near Maidenhead, Berks. Commended.—J. Saunders, West Stafford, Dorchester; and the Earl of Radnor, near Highworth, Berks.

THE NOVELTIES IN THE IMPLEMENT DEPARTMENT.

We heard a sharp young fellow, connected with the implement trade, declare that he was "blest if there was a single new thing in the whole show;" and if his scrutiny be correct, our present report must needs be very short indeed. But, with due deference to such observing powers, we decline to confirm the statement that nothing new was presented. We do not propose to criticise all the fine stands of machinery, but merely to mention some few novelties that we found.

Ransomes and Sims have brought out a skeleton turnwrest plough for hilly land, greatly simplified and improved since we first saw it last year. The action of a lever, which is readily worked by the ploughman without leaving the handles of the plough, brings alternately into operation first one and then the other of a pair of right-hand and left-hand plough breasts, and withdraws the other one, while the share is also turned at the same time. This movement is very ingenious, and the plough altogether perhaps the lightest and most practical of the turnwrest sort. Gretton and Abbott's broken-barley separator, made by Boby, should be well known now among barley-growers: but we found in "the Arcade" a new form of screening apparatus for effecting similar results. This is Poyser's patent, manufactured by Ransomes and Sims. Immediately below the hopper is a fan, the blast of which expels dust, smut, chaff and light corn, allowing the heavier or head-corn to fall upon one or more perforated plates of a stone-separator. In passing through this part of the machine, the grain is thoroughly freed from all stones, beans, peas, dirt, and other foreign substances, the head corn falling upon a sloping screen called the "broken or half-corn separator." The final act is to rub the grain between a perforated plate, screen, and a number of transverse india-rubber rollers fixed above it, which ensures all the broken kernels passing through, while it polishes and brightens the bulk.

The Beverley Iron and Waggon Company have introduced further improvements into their wide reaping machine: the lowermost india-rubber band has been exchanged for an endless-chain of a new shape made by patented machinery, enabling the reaper to cut closer to the ground; the shoe is new, reducing the outside breadth of the machine three inches; the iron stay supporting the reel-frame is placed more out of the way of the delivery of the cut corn; and the reel itself is very properly driven with a slower motion. On Ashby and Jeffery's stand was exhibited a splendidly-executed working model of a new high-pressure condensing steam-engine; and they have made the supports of their remarkably-efficient and easily-adjusted chaff-cutters of wrought angle-iron, giving wonderful stiffness and strength in proportion to the weight.

We shall not be expected to dilate upon the "atmospheric churns." We never yet saw a churn that was not "atmospheric;" and the number of different contrivances which will bring butter in ten minutes out of either cream or whole milk—we are not quite sure how many prefer to churn butter out of old milk or whey—we cannot count on our fingers without going several times backwards and forward. Amies and Barford are bringing out a new potato-planting machine; but as it was not exhibited, but only talked about, we cannot include a description of it among the show novelties. And in the same category of invisible inventions is the instrument which Nicholson, of Newark, has imported from a scientific German at Paris, for eating off incrustation from steam-boilers. Coleman and Morton's new oilcake "cutter" is an improvement upon the breaker, for soft cakes, which make a great deal of dust and waste, and probably it will be found to work easily in getting the hardest cakes into "bullock pieces."

Steam tillage was represented by Messrs. Fowler's engine and plough, and by the reports of its late performances upon light land, which seem to equal any of the results yet attained upon the clays. The great novelty in this department, however, was Messrs. J. and F. Howard's new engine, for working, not only on the "double" system, but on what may be called the "double-double;" there being two implements in work at once, as well as two engines. As the whole system of working and the particular mechanical details of these new engines will be probably described in these columns when the spring affords an opportunity of showing them in action, we merely refer now to the fact of one engine and a drawing of the plan of working having been exhibited at Islington side by side with the Bedford steam-cultivators and champion ploughs.

THE IMPLEMENT STANDS.

GROUND FLOOR.

Baker, T., Compton, Berks.—Liquid manure pump, with 12 feet of suction; and liquid manure and portable iron tumbler carts on wooden wheels, for horse or pony.

Ruston, Proctor, and Co., Lincoln.—Six and eight-horse power portable steam-engines, 8¼ and 9¾ in. cylinders; combined finishing-thrashing machine, with 4 ft. drum and improved chaff-bagging apparatus; and improved circular-saw benches, with 24 and 36 inch saws, fitted with slide-fence of easy adjustment.

Wallis, Haslam, and Stevens, Basingstoke.—Eight-horse power portable engine; 54-inch combined thrashing machines; winnowing machine; corn screen, with extra separator; vertical drilling machines, with lever and screw; set of X 10 Excelsior harrows; sackholders to hang on beam or carry on wheels; 1⅜ and 2¼ inch patent spherical bearings; and patent spring hanger.

Garrett and Sons, Saxmundham.—"Contractor's" portable steam-engine, with high-pressure boiler, arranged for easy conversion into steam cultivating engine; portable agricultural steam-engine for driving thrashing machines and corn mills; locomotive traction steam-engine; single and combined thrashing, dressing, and straw-shaking machines for steam power; light occupation and Suffolk corn, seed, and manure drills; Chambers' manure distributor; improved corn-dressing machines; and lever horse-hoe for general purposes.

Hornsby and Sons, Grantham. — Eight-horse power steam-engine, suitable for every variety of agricultural work or manufacturing purposes; combined thrashing machines with screen and chaff apparatus; swathe side-delivery, and semi-manual side-sheaf reaper (with improvements), "governor" self-raking reaper (new implement), one and two horse back-delivery reapers, with improvements for side-sheafing or swathing; two "Monitor" combined mowers and reapers (new inplement); grass-mowers; corn, seed, and manure drills; an assortment of Champion ploughs and moulding ploughs; root-pulpers and turnip-cutters in various sizes; combined washing, wringing, and mangling machines; and patent mangle.

Tasker and Sons, Andover.—Four-horse power portable steam-engine, for small occupations, with valves for making the tubes self-cleaning; portable combined single and treble blast finishing-thrashing machines, fitted with Ransome's screen and chaff-bagging apparatus; and improved winnowing machine.

Burrell, Thetford, Norfolk.—Eight-horse power single cylinder traction engine; and patent improved straw-elevator, made to deliver at any angle.

Tuxford and Sons, Boston. — Ten-horse power two-cylinder patent housed engines, for agricultural and other purposes; one, two, three, and ten-horse power improved portable horizontal engines; combined thrashing, shaking, dressing, and finishing machines, for three, four, or eight-horse power engines; straw stacker, with 28 feet spout, and patent feeding table for any angle; improved circular-saw table, with 24 inch saw; centrifugal pumps for drainage or irrigation purposes, to discharge 350 and 1,400 gallons per minute; and grinding mill on iron frame, with 3-feet stones.

Fowler and Co., 71, Cornhill, London.—Fourteen-horse power steam ploughing engine, with clip drum attached, mounted on wrought iron wheels 20 inches wide; ten-horse power traction-engine; four-furrow balance plough, with slack gear; and seven-tine cultivator, with slack gear.

Catchpool and Thompson, Colchester.—Portable thrashing machine, for steam power; and Carr's patent twenty-horse power rotating engine.

Dymoke, Kerman, and Co., Spalding.—Steam fire-engine; village brigade, and B. tank, and agricultural farm fire-engines; B. engine, for steam and manual power; agricultural and garden barrows; garden engine; and 2½, 3, 3½, 4, and 5-inch cast iron lift pumps.

Clayton, Shuttleworth, and Co., Lincoln.—Six and eight-horse power portable steam-engines; ten, twelve, and twenty-horse power double cylinder portable steam-engines; eight and ten-horse power single and double cylinder improved traction-engines; six-horse power portable steam-engine, fitted with double barrel irrigation or liquid manure pumps; ten-horse power single cylinder irrigation engine; ten-horse power fixed steam engine and Cornish boiler; single, double, and treble blast thrashing and finishing machines; Hayes' and Campain's straw-elevators; iron frame and other corn mills, with stones of various measurement; 15-inch flour-dressing machine; 24, 30, and 42-inch saw benches; and double-action irrigation and liquid manure pumps.

Ball and Son, Rothwell, Northamptonshire.—Two-horse waggon on spring and patent arms; two strong one-horse carts, with 4 and 4½-inch wheels; light and strong land general purpose ploughs; seven-tined cultivator; and improved horse-rake with steel teeth.

Rawlings, Melbourn, Cambs.—Eight-horse power horizontal steam engine, portable grinding mill, and improved land roller.

Howard, J. and F., Bedford.—Fourteen-horse power traction and steam ploughing engine; double-action steam cultivator, with five tines and ridging body; pair of Bulstrode' snatchblock slings; three-wheel rope porter; one-horse, two-wheel, general purpose, swing, double furrowing, ridging, and other ploughs; sets of three and four-beam harrows, of various widths; improved turnip and chain (or flexible) harrows; horserake with steel teeth; double action haymakers, for small occupations and for three horses; improved iron plough sledge, dynamometer, and new self-acting sheaf delivery reaper.

Kinsey, Nottingham.—Four and twelve-horse power horizontal tank steam engines, the smaller engine requiring no foundation; and one-and-a-half and four-horse power vertical steam engine and boiler.

Holmes and Sons, Norwich.—Portable steam engine; two portable steam thrashing and finishing machines; portable steam power cloverseed sheller; circular-saw table; corn dressing machines; barley hummeller; and corn, seed, and manure drills.

Beverley Iron and Waggon Company, Beverley.—Three-horse double self-acting swathe delivery reaping machine; Newcastle, Plymouth, and Leeds model one-horse carts, with sets of harvest shelving and ladders; Plymouth prize two-horse waggon, with harvest ladders; liquid manure or water carts, with pump and hose pipe, and apparatus for watering four rows of turnips; bone mills, with one and two pairs of rollers, and vibrating or revolving riddles; self-cleaning clod crusher, with pair of travelling wheels; sets of cart and waggon wheels and axles; plain field roller, in nine parts; portable farm railway and tipping trucks; Archimedean root washer; and pig trough.

Ransomes and Sims, Ipswich.—Eight-horse power portable steam engine; eight-horse power self-moving engine; double blast finishing steam thrashing machine; adjustible self-cleaning rotary corn screen; new stone grist mill, on iron frame; pony, one-horse, two-horse, light general purpose, and strong general purpose ploughs, with two wheels; Skelton's improved turnwrest plough; Biddell's bean, oat, combined, and oilcake mills; universal mills for linseed, beans, &c.; single and double action Gardner's turnip cutters; Biddell's root pulpers for hand, horse, and steam power; chaff cutters; and oilcake breaker.

Brown and May, Devizes.—Eight-horse power portable steam engine; and three-and-a-half-horse power portable engine.

Woods and Cocksedge, Stowmarket.—Three and four-horse power improved vertical steam engines; twenty, thirty, and thirty-six inch corn grinding mills, with French burr and Peak stones; universal and roller crushing mills for oats, malt, and linseed; root graters; single and double action Gardner's turnip cutters; one and two-horse works, complete; oilcake breakers; barrel root pulpers, for steam power; one-horse carts, with and without harvest frames to carry 25 and 30 cwt.; and Rumbelow's pig, dog, and poultry troughs.

Turner, E. R. and F., Ipswich.—Portable five horse power steam engine, with improved flush firebox for giving ample water and steam space; C thrashing machine, mounted on wood wheels, and fitted with patent screen; six horse power horizontal fixed engine; mills for crushing linseed, beans, oats, corn, and malt; oilcake breakers for lambs, sheep, and beasts; chaff cutters for hand, horse, and steam; one horse gear work; corn grinding and American grist mills; and thirty inch circular saw mill.

Ashby and Jeffery, Stamford.—Three horse power plain portable steam engine, with flue and tubular boiler; one horse power horizontal stationary steam engine (working model); combined thrashing machine, with beaters and hummellers; Palmerston haymaking machine, with wire screen; improved steel tooth horserake; thirty inch stone flour mill; safety chaff cutters for hand, horse, or steam power; oat and bean mills, on stands; oilcake breaker; chain and rotating harrows; small and large root pulpers; double oat and bean mills; circular saw table, with planed top; set of crank shields; wire garden seats; and Spencer's clod crusher.

Humphries, Pershore.—Portable combined thrashing machine.

The Reading Iron Works (limited), Reading.—Three, six, and eight horse power portable steam engines; eight horse power traction engine; twelve horse power double cylinder portable steam engine; four horse power horizontal fixed engine; one horse power gas engine; 42 and 54 inch combined thrashing and finishing machines; portable horse power thrashing machine; saw bench, with boring apparatus; 42 inch stone grinding mill; cranked axle hay machine; lever horserake; barley aveller; twelve foot seed machine; oilcake, oat-crushing, and oat and bean mills; chaff cutters for hand, horse, or steam power; and sack cart and holder.

Burrows and Carmichael, Banbury.—Eight horse power portable engine; thrashing and finishing machine, fitted with Penney's screen and bean thrashing tackle; and American grist mill.

Marshall, Sons, and Co. (limited), Gainsborough.—Twelve horse power double cylinder portable steam engines; two and a half horse and eight horse power single cylinder steam engine; three self-acting circular and other saw benches, complete.

Gibbons, P. and H. P., Wantage, Berks.—Portable combined thrashing machine, to prepare the corn ready for the market.

Allchin and Sons, Northampton.—Eight horse steel boiler portable steam engine, mounted on springs, and screw jack for portable engines.

Crosskill and Sons, Beverley.—Small and large clod crushers, improved plain rollers; strong one horse, light, pony, and harvest carts; liquid manure carts, with portable pump and pipe; pair horse waggon, pairs of broad and narrow wheels and axles, Victoria reaping machine, single and double roller bone mills; portable farm railway, with side and end tipping truck and turn table; improved fixture and circular pig troughs, and Archimedian root washer.

Robey and Co. (Limited), Lincoln.—Twelve and twenty horse power portable steam engine, six horse power vertical steam engine on foundation plate, and combined thrashing and finishing machine.

Tye, Lincoln.—Double flour mill on metal frame, with two pairs 3ft. 6in. French stones; single mill complete, and beam mill.

THE GALLERIES.

Whitworth and Co., Rotherhithe.—Samples of superphosphate of lime; fish manure for wheat, oats, barley, and hops; grass manure, nitrate of soda, nitro-salt, and ground woollen rags for hops.

Larkworthy, Worcester.—Two-wheel iron plough, pairs of duck-feet scuffle drags, sets of patent "Excelsior" harrows, and steel plough whippletrees.

Headley and Son, Cambridge.—Improved wrought iron water cart, with pump and suction pipe and manure distributor; wrought iron nine-tine cultivator, and wrought iron cattle and pig troughs of various measurements.

Cambridge and Co., Bristol.—Notched wheel rollers or clod crushers of various diameters, combined tine and chain harrows for one and two horse power (round and square iron), double blast winnowing machine, single and double action turnip and chaff cutters, one and two horse gear, two wheel and three wheel land pressers, and horse rakes.

Peirce, 75, Bridge-road, Hammersmith.—An assortment of inimitable pig, cattle, and sheep troughs, in various sizes; patent 160-gallon water cart, trough, crib, dipping apparatus, or fire engine; samples of navvy, garden, farmyard, and galvanized wheelbarrows and waterbarrows, shop and maltsters' trucks, specimens of shovels, garden syringes and engines, portable furnace and steaming apparatus, corn bins and corn measures, dairy utensils, galvanized iron farmyard buckets, water pots and manure bowls.

Penney and Co. (Limited), Lincoln.—Four sizes of adjustable corn separators, two improved sack lifters, malt and register gravel or lime screen, rolls of galvanized wire sheep and game netting; and washing, wringing, and mangling machines.

Gibbs and Co., Half-moon-street, Piccadilly.—Collections of dried specimens of permanent grasses; specimens of English and foreign wheats, barleys, and oats in the ear; and samples of agricultural and kitchen garden seeds, mangel wurzels, swedes and other turnips, carrots, parsnips, kohl rabi, cattle cabbages, &c., in great variety.

Unite, Edgeware-road, London.—Model of rick cloths, samples of hay and horse cloths, sacks, sheep netting, halters, hay ropes, and cart grease.

Wheeler and Son, Gloucester.—Collections of roots and seeds.

Edgington and Co., Old Kent-road, London.—Various tarpaulin and canvas waggon and cart covers, sheep netting, samples of wheel grease, engine oil, and manures; horse covers, nosebags, aprons, halters, driving bands, and flour and bran sacks.

Gibbs and Co., Down-street, Piccadilly.—A general collection of agricultural roots, dried grasses, wheat, barley, oats, and various seeds.

Paget, Clerkenwell, London.—A collection of navy, hay, waggon, and cart tarpaulins, canvas, and indiarubber sheeting and covers in various measurements; horse blankets, saddlery, and stable necessaries; sacks of various dimensions, sack tyers and plough line, and models of marquees and tents.

Wright and Son, Great Bentley.—Grass specimens and seed, and agricultural seeds and roots.

Morton and Co. (Limited), Liverpool.—A collection of models and drawings illustrative of the application of iron roofing for agricultural purposes; models, drawings, and specimens of park and farm fencing; and models of iron buildings, hay barns, stores, &c.

Raynbird, Caldecott, Bawtree, Downing, and Co. (Limited), Basingstoke.—Collection of agricultural seeds, seed corn, and roots; and collections of oilcakes, feeding stuffs, and manures.

Barr and Sugden, King-street, Covent-garden.—Seeds and roots, with a variety of horticultural elegancies and necessaries.

Alway, Chapel-street, London.—An assortment of milkman's necessaries, and dairy utensils in great variety.

Allnutt, Fleet-street, London. — Specimen copies of *Estates Gazette* newspaper, weekly and annual wheat diagrams, catalogue and selection of agricultural books and instruments, and land agents' directory.

Arnold and Son, Smithfield, London.—A general assortment of instruments and apparatus in use amongst veterinary surgeons for service with horses, cattle, sheep, &c.

Angel, 171, Fleet-street, London.—Miscellaneous collection of agricultural and horticultural books.

The Atmospheric Churn Company (Limited), Bond-street, London.—Samples of one to eight-gallon churns with pump handles, and fourteen-gallon churn with rotary motion.

Herbert, Gray's Inn-road, London.—An assortment of scales, weighing machines, weights, and steelyards; corn and seed measures, and hand barrows.

Brown, Oakley-street, London.—Samples of steel spring lever oil feeders, Excelsior vermin exterminator, and Lewis's horse and cattle embrocation.

Coudron, T. and R., Bingfield-street, London.—Flexible brushes for cleaning horses and carts.

Croggon and Co., London.—Samples of felt, poultry and rabbit fencing, perforated zinc, galvanized pails and feeding troughs, garden and fire engines, spades and shovels, models of galvanized iron building and shed covered with felt, galvanized black iron cisterns, and wrought iron guttering.

Cullingford, Stratford.—Cocoa nut fibre, hemp, wire, batfolding, and rabbit netting in variety; bird traps and nets, rick cloths, cord, and garden netting.

Day, Son, and Hewitt, London.—Stock-breeder's medicine chest, chests of "Chemical extracts," "gaseous fluids," "red drench or inflammation powders," and "red paste or condition balls;" copies of three agricultural pamphlets—"Key to Farriery," "Rearing of Calves," and the "Breeding and Management of Sheep.

Denton, Wolverhampton.—Sets of different-sized chain harrows.

The Driffield and East-Riding Pure Linseed Cake Company (Limited), Yorkshire.—Samples of pure linseed cake.

Hall, Westbury.—Collection of roots.

The Gutta Percha Company.—Samples of bands and tubing, liquid-manure pump and suction complete, gutta percha veterinary instrument, malting shovels, buckets, measures, watering-cans, carboys, and roll sheeting.

Hardon, Manchester.—Patent cake and condimented food.

Mason, Ipswich.—Portable boilers and steamers, and hand drills.

Reynolds, London.—Variety of poultry and game preserving netting, and hurdles; galvanized riddles for gravel, and seed protectors.

Holgate and Co., London.—Mill bands, hose pipes, buckets, and heavy cart harness.

Spratt, and Co., London.—Febrine dog biscuits, and meal for poultry and pigs.

Tilbury and Co., London.—Variety of pressure gauges, gauge mountings, gauge glasses, valves, and steam cocks; and improved scales for weighing sheep and agricultural produce.

Salkeld and Co., London.—The "Jebb" tubular churn, American grist mills, sausage and mincing machines, circular-saw bench, wine and cyder press, and American washing and mangling machine.

White, London.—Specimens of oil-feeders for small and large machines, chaff cutters, thrashing machines, and powerful engines and machinery; artificial dams for feeding foals and calves; wringing and washing machines; specimen coils of condensed leather bands and laces; and a variety of save-all oil cans.

Rosher, F. and G., London.—Improved paving bricks or stables, cattle sheds, and yards; glazed walls and other iles, and variety of garden brick and tile edgings.

t **Robinson and Nlave**, Barton-on-Humber. — Cases of water cart and liquid manure cart valves, and model of clod crusher.

Johnston, London.—Churns in sizes for from 1 to 20 pounds of butter; milk pails, pans, yokes, sieves, and butter prints, knives, and beaters.

Jones, Gloucester.—Gloucestershire specific for foot-rot in sheep; and composition for waterproofing and preserving all descriptions of leather.

Mathews, Son, and Co., Driffield.—Samples of new corn feeding cake.

Toole and Co., Dublin.—"The Monitor" combined reaper and mower.

Hodson, Louth, Lincolnshire. — Specimens of hayforks, draining tools, swathe rakes, and agricultural hand tools.

Hitchcock, Bury St. Edmunds.—Samples of leather driving bands.

Hirst and Son, Halifax.—Two waterfall washing, wringing, and mangling machines; ten to twenty inch manuring machines; and various turnip cutters.

Hooper and Co., London.—Variety of agricultural seeds and roots.

Carter and Co., London.—Dried specimens of natural grasses, collection of agricultural roots, and combined mowing and reaping machine.

Edgington, B., London.—An assortment of rick, hay, waggon, and other tarpaulin and canvas cloths in various sizes; fruit, sheep, and poultry netting; horse cloths and nose-bags, sacks and bags; samples of cart grease; and models of marquees for agricultural or other shows.

Skirving, Liverpool.—Collection of roots and seeds.

King, London.—Samples of sacks, rick cloths, nose-bags, horse clothing, and ropes and lines.

Humphries, Walton-on-Thames.—Continuous-action pump, and portable lift and force pump.

Edgington, J., London.—Samples of tarpaulins, sacks, horse and hay cloths, nose-bags, and model of rick cloth.

Sutton and Sons, Reading.—Collection of 200 distinct specimens of natural grasses; specimens of improved varieties of mangel wurzels, swedes, and other turnips, green and purple kohl rabi, large drumhead cabbages, and about fifty samples of potatoes for field or garden culture.

Owens and Co., London.—" Cassiobury" fire extinguisher with delivery hose; estate or factor's fire engine; Holman's double barrel fire engine; force pumps, hydraulic rams for raising water; liquid manure, garden, and cottage pumps; Paxton garden engines; and collection of hose pipes and pulley blocks.

The St. Pancras Iron Works Co. (Limited), London.—Wrought iron stable or cattle stall divisions and loose boxes; an assortment of wrought iron and other stable fittings and necessaries; specimens of stable paving bricks; improved iron cow stalls and piggeries; collection of collar bar; sheep and cattle hurdles, field gates; and specimens of wire rope for fencing.

Hancock, J. and F., Dudley.—Machines for purifying butter, in sizes for household use, and for from one up to 30 cows.

Eaton and Co., Birmingham.—Grinding mill for agricultural purposes.

Tinkler, Penrith.—Three sizes of patent churns.

Nalder and Nalder (Limited), Wantage, Berks.—Winnowing and dressing machines; machine-made corn-screens for hand power; screens for thrashing machines; sack holder; and model of new roller.

Weir, London.—Spirit and workmen's drain-level; sets of box, metallic, and double-action churns of various sizes; sets of dairy utensils, instruments, and necessaries; parallel vice for farm work; washing, wringing, and mangling machines; steel mills, mincing-machines, and sets of poultry-feeding apparatus.

Deane, J. and A., London-bridge.—Variety of farm harness, nosebags, and horse-cloths; corn and flour bins in various sizes; waggon and cart-jacks, bruising-mill, chaff-cutters, enamelled mangers and water-troughs, and collection of stable fixtures, tools, and requisites.

Read, London.—Garden watering engines, lever-action pail engines, suction pumps, greenhouse and veterinary syringes, and variety of instruments for horse and cattle service.

Burney and Co., London. — Wrought-iron 400-gallon cistern; water or liquid-manure cart body to hold 200 gallons; wrought-iron corn bins; and round iron edge cattle-troughs, to hold 53 gallons.

Cottam and Co., London.—Model of stable stalls and loose boxes, set of portable cow fittings, samples of wrought-iron corn bins, and loose-box and stall fittings; sets of ventilating brackets, for stable use; and samples of stable furniture and paving.

Freer and Co., Rothley, Leicestershire.—New patent six-wheel dibbling machine.

Coultas, Grantham.—Two twelve-row general purpose and corn drills, and Royal Society's prize reaper.

Boby, Bury St. Edmunds.—Three sizes of corn screens, with stone separator; corn screen, with Gretton and Abbott's apparatus for removing broken barley; Gretton and Abbott's barley extractor dressing machines, barley aveller; and two sizes of double-action haymakers.

Downing, London.—Chaff machines, turnip cutter, pulper, corn bruising mills, corn bins, sack truck, lawn-mowing machines, and samples of hay and manure forks.

Lloyd and Son, London.—Nine sizes of flour mill and dressing machine, eight corn crushers, corn-grinding mills, and seed mills, for horse or cattle medicines.

Brawn and Co., London.—Lawn mowers, with ten to thirty-inch cutters; chaff-cutting machine, corn-crushing mills, washing and mangling machines, portable platform weighing machines, hydropults, and fire annihilators, barrow engine, galvanized wire netting and fencing, and wrought iron hurdles, roller, and garden seats.

Tyler and Co., London.—Powerful double-barrel irrigating pumps " California," fire engine, and double-acting lift force and barrow pumps; improved horse reels, various sizes; ornamental cottage and house pumps, liquid-manure pumps, with suction hose complete; model garden, and engines, water barrows, garden syringes, and Jordan's " Combination" steam boiler, for agricultural and other purposes.

Rollins, London.—American wheel horse-rake, combined blowing and dressing machines, thermometer churns, Fairbanks and Shaler's sack weighing machines; bundles of hay and manure forms, hay rakes, spades and shovels; American cistern pumps, garden barrow, seed sower, roller cotton gin, scales for farm use, farmers' tools, and mounted grindstone.

Picksley, Sims, and Co., Leigh, Lancashire.—Albion and Bedford pattern chaff-cutters, of various sizes; steel mill, with pulleys; oat and bean mills, with pulleys; Hardley's oil-cake and roller mills; Gardner's and treble-action turnip cutters, pulpers, horse-gear complete; combined reaper and mower; sack trucks and pig troughs.

Stacey and Sons, Uxbridge.—Four sizes of chaff-cutters, horse-power chaff-cutters, and set of iron harrows.

Wedlake, Hornchurch, Essex.—Three-horse power portable engine; thrashing machine, with 4-feet drum; one, two, and four-horse patent safety gear, with adjustable intermediate motion; patent hay machine, horse-rake, chaff cutter, corn-mill, one-horse spur gear, circular-saw bench with augurs, and large portable crushing mill.

Warren, Waldon.—Six chaff cutters; set of one-horse gear; double and single-action turnip-cutters, oilcake mills, hand and horse-power bean mills, oat bruiser, patent iron-beam ploughs, sets of harrows and round pig troughs.

Branford and Son, March, Cambridgeshire.—Diamond and lever horse hoes, and washing, wringing, and mangling machines.

Amies, Barford, and Co., Peterborough.—Improved corn-grinding mills, for horse or steam power; portable and fixed steaming apparatus; wrought-iron water-ballasting field and garden rollers; large and small size oilcake mills, and new potato planting machine.

Woods, London.—Grass-mower, constructed to be changed from a mower to a reaper, one-horse reaping-machine, and self-rake side-delivery reaper.

Smith and Grace, Thrapston.—Pulping-machine, single and double grist and bean mills, and chaff-cutters.

Brigham & Bickerton, Berwick-on-Tweed.—Excelsior self-delivery reaping-machine, and Buckeye junior combined reaping and mowing machine.

Kittmer, Louth, Lincolnshire.—Combined dressing and blowing machines, with double moving screens.

Ransome and Co., London.—Weston's differential pulleys, Wilmot's sack-truck, lifting-jacks, leather driving-bands, glass and other gauges, steam-cocks, portable forge, atmospheric churn, iron corn-bins, Nye's, Hale's, and Excelsior sausage and mincing-machines, iron bottle rack, weighing-machine for farm purposes, Long's specific, and fleeces to show the use of Long's preparations.

Burgess and Key, London.—New swathe-delivery reaping-machine, McCormick's sheaf-delivery reaper, one-horse reaping-machine to deliver at the back out of the way of the horses, and mowing machine with parts for reaping.

Bamlett, Thirsk.—Two-horse grass-mowing machines, and combined mowing and reaping-machines.

Sawney, Beverley.—Winnowing, blowing, screening, and hariff machines, improved sheep racks, rack-lifter, improved treadle grindstone, and riddling-machines.

Bury and Pollard, London.—Portable wind-engine for driving turnip-cutters or small grist-mills, combined oat-bruiser and bean-kibbler, portable iron seed-rack, conical boiler and stand, set of four conical boilers, and model of self-regulating wind-engine.

Smith, Kettering.—The Plymouth and improved horse-hoes, winnowing-machines, blower and winnowing-machines combined, improved cake-breaker, sack-truck and sack-holder.

Nicholson, Newark.—Four hay-making machines, cake crushing mills, sack elevators, winnowers, corn elevator, sack lifter and weighing machine, garden roller, barn and malt shovels, and horse-rakes.

Page and Co., Bradford.—Draining pipe and tile machines, chaff-cutting machines, disc root-pulpers, linseed-cake mills, colonial and wrought-iron ploughs with one and two wheels, sets of diagonal iron harrows, pair of scuffle-drags or twitch harrows, and galvanized corrugated-iron pig and sheep troughs.

Samuelson and Co. Banbury.—Self-raking manual-delivery and swathe-delivery reaping machines, grass mowers, single and double-acting turnip cutters, chaff cutters, and root pulpers.

Ball, Rugby.—Cart for agricultural purposes.

Mason, Alford, Lincolnshire.—Sheep, pig, wool, and hop-weighing machines, machines for weighing agricultural produce generally, double-action cake-breaker, double-action hand turnip cutter, small and large sack-barrows, and case of butter scales.

Turner's Patent Strap and Hose Company, London.

—Collection of sample rolls of improved single-leather driving straps for all purposes.

Irwin, London.—Atmospheric churns, assortment of garden implements, liquid manure pumps, spades and digging forks, sausage and mincing machines, weighing machine, grindstone, hose and tubing, garden seat, dairy utensils, and roofing felt.

Priest and Woolnough, Kingston-on-Thames.—Nine, eleven, and thirteen-row Norfolk, Surrey, and Suffolk drills; lever horse hoes for light, heavy, and mixed land; turnip and manure drill, manure distributor, drills for grass seeds and general purposes, and Price's coke and coal barrow.

Treloar, London.—Netting for sheepfolds, stable brushes, and lining for stables.

Bentall, Maldon.—Chaff-cutters for hand, horse, or steam power; disc and other root pulpers, Gardner's single and double-action turnip-cutters, corn and seed-crushers and bean kibblers for horse and steam power, universal mill, oilcake breakers for hand and horse power, horse gear and intermediate motion for drawing chaff-cutter or thrashing machine; broadshare, scarifier, and subsoil mouldboard, and other ploughs; single-ridge mangle hoe, two-wheel potato raiser, and thrashing machines.

Maynard, Whittlesford.—Portable steam-power sifting chaff engine, and model of a self-acting horse rake.

Sheen, T. and R., Aylesbury, Bucks.—Chaff-cutters for hand or horse power, single and double-action turnip-cutters, bean mill, combined mill, horse hoe, wrought-iron cultivator, sack barrows, and tin shovels.

James, Cheltenham.—Liquid manure distributors with stirrers and force pumps; washing, wringing, and mangling machines; bundle of gapping drills, and roller or clod-crusher.

Green and Co., London.—Four-horse steam engine and boiler, sausage-chopping machines, lawn-mowing machines, and garden rollers.

Wilkins, Ipswich.—Portable combined corn-grinding mill and chaff-cutter on four wheels, and corn-grinding mill for horse and steam power.

Trowbridge, London. — Corn, hay, and general farm-purpose weighing machines; platform weighing machines for cattle, dairy scales and weights, corn measures, and sack trucks.

Strafford, Euston-square, London.—Set of Coates's Herd-Book and agricultural works.

Taylor and Co. (late Dray, Taylor, and Co.), London-bridge.—Chaff-cutting machines for hand or horse power, oat and bean-crushing mills, improved grindstones; combined pulper, stripper, and slicer; double-action turnip-cutter, improved corn bins, American box churns, improved portable boiler, improved oilcake-breaker.

Whitmee and Co., London.—A variety of corn-crushers, corn-grinding mills, domestic flour mills, chaff-cutting machines, and two French burr-stone flour mills.

Ray, Mead, and Co., London.—Two-and-a-half horse power horizontal engine and boiler complete, chaff machines, four to eight-bushel square corn-bins, galvanized-iron wheelbarrows, manure or water carriers and cisterns, galvanized-iron bowls, stable buckets, and vanes.

Hill and Smith, Brierley Hill.—Specimen lengths of continuous and premium fencing, flat and round-bar iron hurdles, wrought-iron field and entrance gates and pillars, wrought-iron tree-guard, sample of game-proof netting, rotary gravel screen, wrought-iron cow-crib and wheelbarrows, and samples of black varnish for fencing and hurdles.

Burchfield and Son, London.—Improved chaff-cutters for hand power, portable flour mill, oat bruiser, and variety of weighing machines.

Carson and Toone. — Chaff-cutting engines for hand, horse, and steam power; Moody's patent turnip cutters, oilcake crushers, prize horse hoes, single cheese press, and two-horse gear.

Peene, Braintree.—Root graters, single and double-action oilcake breakers, and hand power chaff-cutters.

Smyth and Sons, Peasenhall.—Lever seed and manure drills, and clover seed box.

Boyd and Co., London.—Brush and croquet lawn mowers; "Economical" chaff-cutters, double-action turnip cutters, root pulpers and slicers; Universal oat, bean, barley, and malt mills; samples of hurdles, fences, and gates; wire netting; corn bins; self-adjusting scythes; and pig and poultry troughs.

Brenton, Polbathic, Cornwall.—Reaping machine.

Hughes and Sons, London. — French runner and bed stones; Newcastle grindstone; smut and flour dressing machines; iron prober, mahogany stone staff, pulley blocks, corn measures, sack barrows, wire, lifting jacks, and other millers' necessaries.

Dell, London.—French burr runners and bed stones, wheat cleaning machine, smut cleaning machine for flour mills, portable agricultural mill, sack lifters and barrows, rolls of wire, screw lifting jacks, leather driving bands, millers' flour scales, bench vice for farm use, and a large variety of articles in connection with the milling trade.

Clay, Wakefield. — Cultivators with grubber and drag harrow, horse hoes, chain harrows, one-horse grubber, and urnip cutters.

Whitehead, Preston.—Machines for making solid bricks by horse, steam, or water power; drain pipe, tile, and brick-making machine for hand power; and improved brick pressing machine.

Hunt, R. and R.—Steam power clover and trefoil seed drawing machine; side and back delivery manual reaping machines; one-horse gear with intermediate motion; corn and seed dressing machine; single and double turnip cutters; improved oilcake breakers; improved disc root pulpers, root graters; and barrow and one-row hand drills.

Topham, London.—Variety of self-expanding and other brushes for cleaning boiler tubes, and patent oil cans.

Tree and Co., London.—Variety of cattle gauges and rules for measurement; horse standard in Malacca walking cane; telescope draining level, and agricultural barometer, thermometer, and microscope.

Webb and Son, Stowmarket.—An assortment of leather machine bands, buckets, and hose.

Smith, Ipswich.—Improved horserakes, cultivator, sets of solid beam harrows, and model of drying and cleaning machine for corn, &c.

Richmond and Chandler, Salford. — Chaff cutters for hand, horse, or steam power; corn crushers; improved horse gear with motion; steaming apparatus, sack holders, root washers, and turnip cutters.

Hunt and Pickering, Leicester.—Cake breakers, chaff cutters for hand and horse power, corn crushers, sack barrows, turnip cutters, combined root pulpers and slice strippers, meadow and lawn mowers, plough with steel mould board, sets of whippletrees, and bundle of twitch rakes.

Baker, Wisbeach.—Combined blowing and dressing machines, and elastic reaping machine rake.

Reeves, R. and J., Westbury.—Two and three-row liquid manure and seed drills; lever, small occupation, and manure and seed drills; manure distributor, water cart, barrow pump and tubing, and corn screen.

Coleman and Morton, Chelmsford. — Cultivators for mixed, heavy, and general purposes; Hanson's potato diggers; horse gear complete; improved dressing machine; water cart, rope porter for steam cultivation, and samples of shares for cultivators.

ANNUAL MEETING OF THE SMITHFIELD CLUB.

The annual meeting of the Smithfield Club was held on the Tuesday in the Show week, at the Club rooms in the Agricultural Hall, the President, his Grace the Duke of Richmond, occupying the chair.

The minutes of the last meeting having been read and confirmed, the Hon. Secretary, Mr. Brandreth Gibbs, read the report of the Council. It stated that in order to obtain the necessary licence for holding the show, under the Order in Council referring to "exhibitions of fat stock for immediate slaughter," it was found necessary that an undertaking should be given by the Metropolitan Board of Works to the Privy Council that all the cattle should be slaughtered within four days of the close of the exhibition, and within the metropolis, and that consequently the Metropolitan Board of Works required a similar undertaking to be given on behalf of the Club. This arrangement having been come to, the Council deemed it their duty to take a similar undertaking from each exhibitor of cattle, and in order that the destruction of every animal might be traced, they directed that the "delivery order" should contain the name and address of the butcher by whom it had been purchased or the person to whom it is to be delivered. The Council therefore requested his Grace the President and the Hon. Secretary to wait on the authorities at the Cattle-plague Department, to ascertain the exact conditions required as to the slaughter of sheep and pigs, in order that notice of the same might be posted in the yard this day (Wednesday), and, if necessary, that fresh delivery orders for sheep and pigs should be issued. The Council further reported that the accounts for the year to the 1st inst. showed a balance in hand of 2,413 2s. 6d. The total receipts are £2,668 3s., and the expenditure £2,954 1s. 6d.—thus showing an excess of expenditure over income of £276 18s. 6d. This increase of expenditure has been occasioned in some degree by the extra expense incurred in consequence of the cattle plague, amounting to about £100, in addition to which there are the fees paid to the stewards and judges and the rewards to the feeders of the first-prize animals; but at the present show they anticipate a saving of about £45. The capital of the Club invested as reserve in the Three per Cents. amounts to £4,971 5s. 9d. Once more turning their attention to the cattle plague, the Council announce that they had come to the following resolutions, which they had requested the President and the Hon. Secretary to present to the Privy Council:

1. That no fair or market for store stock be opened before the 1st of April;
2. That the greatest care should be taken that the regulations as to the quarantine be rigidly adhered to; and
3. That permanent lairs be established at the ports of debarkation.

Mr. Moore (Coleshill), in moving the adoption of the report, observed that the steps taken by the Council on the whole seemed to be satisfactory, and, without entering into details, he ventured to express what he was sure was the general feeling throughout the yard, namely, how much they were all indebted to the active and vigorous exertions of their Hon. Secretary (Hear, hear).

Mr. G. Turner seconded the motion, which was put from the chair and carried *nem. con.*

Lord Berners proposed that the Earl of Hardwicke be elected President for the year 1868. The noble earl had not been with them for several years, and he was quite certain that his coming again to preside over them once more would be an event that would be hailed with universal approbation.

Lord Feversham seconded the motion most cordially, inquiring at the same time whether Lord Berners had ascertained Lord Hardwicke's own views on the subject, and whether he would consent to act if appointed.

Lord Berners had put that question to the Secretary, who had given him to understand that it was probable Lord Hardwicke would accept the office.

Mr. Gibbs said he had not communicated with the noble earl, but he thought that was likely.

Mr. Torr observed that the Club was provided with a president for 1867, and the motion applied to 1868.

The motion was then agreed to unanimously.

On the motion of Mr. C. Barnett, seconded by Mr. J. Clayden, the vice-presidents were re-elected; and on the motion of Major-General Hood, seconded by Mr. J. Ellman, Messrs. Charles Barnett and Samuel Druce were re-elected trustees, and Mr. Torr was chosen as the third trustee, to fill the vacancy created by the death of Mr. Greatham.

Mr. Torr moved the re-election of Mr. Brandreth Gibbs as hon. secretary, which he remarked was one of the most popular motions that could be made. The proposition, having been seconded by Mr. Painter, was carried by acclamation.

The eight places in the Council made vacant by the retirement in rotation of Messrs. Buckley, C. Howard, H. W. Keary, R. Leeds, R. Overman, J. Robinson, H. Smith, and J. Thompson, who are ineligible for re-election until the expiration of a year, were then filled up by the appointment of Mr. John Baldwin, Luddington, Stratford-on-Avon; Mr. Richard Hornsby, Spittlegate, Grantham; Mr. E. W. Moore, Coleshill, Highworth; Mr. Clare Sewell Read, M.P., Honingham Thorpe, Norwich; Mr. W. Sanday, Holmepierrepont, Nottingham; Mr. H. Thurnall, Royston, Herts; Mr. J. S. Turner, Chyngton, Seaford, Sussex; and Mr. Owen Wallis, Overstone, Northampton, all of whose names were contained in the "House List."

In reporting the result of the ballot,

Mr. Crosskill, one of the scrutineers, suggested on their behalf that the bye-law should be altered so that twelve names might be submitted instead of eight. This would, he said, enable the members to exercise some choice in the election, which they were precluded from doing now.

Mr. Gibbs said, to do that it would be necessary to call a special general meeting of the Club.

The Chairman remarked that the suggestion necessitated his putting the question whether they desired to have a special meeting for the purpose of taking the matter into consideration ("No, no").

Mr. Crosskill had hoped the Council could have done it, and that at the next general meeting the members would confirm it.

Mr. Gibbs said by one of the bye-laws a formal notice was required to be given of a special meeting for any such purpose, and all the members of the Club would have to be summoned.

Lord Berners added, that, as the matter stood, it was open to members to obliterate any of the names in the house-list and substitute others for them.

The subject then dropped.

A vote of thanks to the President having been carried by acclamation,

His Grace, in acknowledging the compliment, said it was a matter of much gratification to him to be so intimately connected with the Smithfield Club as he had been during the past year. The Council had had very little to do, owing to the efficient exertions of their hon. secretary in getting the Show allowed by the Government; indeed, he believed that but for Mr. Gibbs they would not have had the Show this year (Hear, hear). That afternoon it would be his duty, accompanied by the secretary, to attend on Colonel Harness, at the Privy Council, for the purpose of ascertaining whether the rule as to slaughtering within four days applied to sheep and pigs as well as to cattle, and no time should be lost in publishing the result in the yard, so that if the sheep and pigs were not to be slaughtered within four days the exhibitors might have the chance of making the best terms they could with the butchers. It was also his intention to see the Duke of Buckingham, and impress upon him the necessity of carrying out the resolutions adopted by the Council of the Club that day; and he hoped to be able to report the result of the interview at the dinner on the following evening (cheers).

Mr. Smith, an exhibitor of Devons, complained of the alteration made in the position of the lairs, which had had the effect, he said, of putting that class of stock somewhat in the background (a laugh).

The Hon. Secretary replied that the alteration was made by the new Clerk of the Works, who was not acquainted with the previous arrangements, and that when the mistake was discovered it was too late to correct it.

Mr. Smith observed that generally the visitors took more interest in the Devons than in any other class of cattle (laughter), adding that it looked as if the object of the change had been to put them out of sight as much as possible (laughter, and cries of "Oh!")

This terminated the proceedings.

THE SMITHFIELD CLUB DINNER.

The annual dinner of the Smithfield Club came off on the Wednesday, at the Salisbury Hotel, Salisbury Square, when the chair was taken by the President, his Grace the Duke of Richmond; and aobut 80 sat down.

The company was admirably catered for by the manager of the hotel, Mr. Lewis, who gave practical proof that the "Salisbury" is a worthy competitor of the most popular public dining establishments in London.

After the usual loyal toasts,

The Chairman gave "The Army, the Navy, the Militia, and the Volunteers."

Major-Gen. A. N. Hood, in responding on behalf of the army observed that it might be said to be now in a state of transition. In a few months it would be armed with breach-loading rifles, and though the would be converted Enfields they were considered by judges superior to any other arm of the same kind in Europe. Moreover, the recent military commission recommended important changes in our system of recruiting, in pensions, pay, allowances, and various other matters. All this must, he believed, tend to improve the condition of the army and to render it more efficient than it had been hitherto.

Mr. UPCHER, in responding for the Volunteers, remarked that they comprised a total force of from 150,000 to 200,000 men, and he hoped that whenever they might be called upon it would be found that they had not forgotten the words of Nelson—"England expects every man to do his duty."

The CHAIRMAN said he now rose to propose the toast of the evening, namely, "Success to the Smithfield Club"; and although that might seem like proposing that they should drink to their own success, yet it should be recollected that connected with that success was the welfare and good of all classes of the community (cheers). That it was a club which had for its end the improvement of agriculture in the production of the various classes of stock that were exhibited at its shows; and he thought that if it had not been productive of benefit to the farmers and the country, it would not be supported as it had been; they might fairly assume that it would have fallen through altogether, and that if it had been of no use nothing would have been heard of it (Hear, hear). Those who were in the habit of attending exhibitions of stock, whether in the south or in the north, must be aware that after a Society of this sort had been in operation some time, nothing was so common as to find in the reports of its judges of stock the statement that they could not close their observations without calling attention to the great improvement in the breed of stock in their district since the institution had been formed. Especially was this the case in the North, in Scotland; because there, until of late years, such societies had not been so common as in England (Hear, hear). He was indebted to a pamphlet written by their honorary secretary a few years ago for the history of the rise and progress of the Smithfield Club; and with their permission he would call attention to a few prominent points connected with the Club which he had gathered from that publication. He found, then, that the club was originally established in the year 1798, and became a permanent institution in 1800. At first it consistsd of only 50 members; and in that year the three days' admission fee produced only £40 3s.; whereas a gentleman connected with the building where the stock was now exhibited had informed him that the receipts for the first two days of the present week reached £2,000. And he believed that, instead of 50 members, they now numbered upwards of 300 (cheers). In the year 1821 the then Duke of Bedford proposed to dissolve the Club, on the ground that, in his view, it had attained the highest point of success that it could ever hope to reach, and that, therefore, it could be of no further benefit to the country. Fortunately, however, both for the country and for agriculture, Sir John Sebright, being of a different opinion, moved and carried, as an amendment, that the Club should be continued. And the result was that the Society had gone on increasing in numbers and in influence until it had attained its present gigantic proportions (cheers). He confessed that, when reading the pamphlet referred to, he was led to make a comparison, which perhaps some persons might be inclined to laugh at, for the simple reason that they had not the same grounds for thinking so much as himself about the Southdown sheep (Hear, hear, and a laugh). Now he could not help comparing the history of the Smithfield Club to that of the Southdown sheep. The Club began its career in 1800 with small proportions. The Ellman of that day was one of the most famous breeders of Southdowns, and his sheep were termed very small animals. Thus the Smithfield Club and the Southdown sheep were pretty much on a par. But since, the Club had increased in size and usefulness, and so had the Southdown sheep (cheers). The Club had assumed very large dimensions, and so had the Southdown sheep (renewed cheers, and laughter). And here he ought to stop, with the expression of a hope that neither the Smithfield Cattle Club nor the Southdown sheep would ever attain such gigantic proportions as to make them unwieldly and unfit for the purposes for which they were designed (cheers). There was another point of view in which the Club was of great utility. It enabled them to detect the points in which their sheep and beasts were faulty, and to get hints which they might take home with them, and there digest and improve upon. And it had certainly this effect also in his own case, that this year it had entirely confirmed the opinion he had expressed before leaving home, that the old sheep were the best he had ever seen sent from Goodwood, whilst the others were but moderate (Hear, hear). In this view one of the judges had stated his full concurrence; and he mentioned the matter now in order to show the great advantage of having those public shows, where they could come and form their own opinion as to whether the animals they exhibited were good or not, and what were the points in respect of which they might be improved. Another recommendation of the Club was the social advantages connected with it. In this country it was of the greatest importance that all classes should have an opportunity of mixing together. If they confined themselves solely to their own immediate circle, they got dull, stupid, and rusty; and if they rubbed up against other persons and classes they must be either very dull or very stupid if they did not derive from such contact something for which they would be the better (Hear, hear). At least such was the case with himself; and he ventured to say there was no occasion on which it was his pleasure to meet farmers that he was not able to take away with him some information that he afterwards found to be most valuuble (cheers). Such meetings enabled the largest landowners and the smallest occupiers to mix on terms of equality, kindly-fellowship, and goodwill (loud cheers). He must say he always felt very much at home at meetings of farmers. There was a sort of free-masonry about those who assembled at them, at which they all felt as if they were rowing in the same boat; and there was a blending together—a cementing of good fellowship—which he could not help thinking was a good thing for the country. He considered that Club worthy of support, then, on three grounds: first, because it had done a great deal practically for the improvement of all classes of breeds of stock and sheep; and if it had not had that effect it would not have been supported as it had been, and continued to be. And, in the next place, because it was exceedingly useful, in a social point of view, in bringing different classes of agriculturists together, and putting them, for the time, on the footing of equality that they ought to be (cheers). Before sitting down he wished to remark that, in compliance with a resolution unanimously passed at a general meeting of the Club on the previous afternoon, the Honorary Secretary and himself had had an interview on that afternoon with the President of the Council, and delivered to him the resolution recommending the continued closing of markets and fairs, and urging the great necessity for having the orders relating to quarantine more strictly enforced than they appeared to have been on many occasions; and, further, that it was highly desirable that permanent lairs should be established at the ports where foreign cattle were disembarked. The President of the Council received them in the most courteous manner, and, after discussing with them the points raised, said they would receive the most careful consideration, and that he felt exceedingly obliged to the Club for the suggestions which it had made. He thought he ought further to add that it was highly desirable that it should be generally known that the disease had, unfortunately, broken out again, chiefly owing to very great neglect on the part of farmers themselves. There appeared to have been a sort of reckless conduct where the disease had revived, a repetition of which could not be too strongly deprecated; and he hoped they would be the means of convincing persons in the various parts of the country with which they were connected that all the precautionary restrictions which had been in operation this year should be still maintained (Hear, hear). He understood the President to say—the Hon. Secretary would correct him if he were mistaken—that at Holderness, in Yorkshire, the re-appearance of the disease was caused by extraordinary neglect on the part of farmers in the district. He would not detain the company any longer on that subject, but he was glad to have had an opportunity of making these remarks; and he would now call upon them cordially to drink "Success to the Smithfield Club."

The HON. SECRETARY then proceeded to read the list of winners of the gold medals and cups for the different classes of animals, their healths being proposed in succession.

Mr. R. STRATTON, in returning thanks for his health, as the exhibitor of the best cow or heifer in the yard, remarked that the shorthorn heifers this year were pretty good; but that the oxen in that class were not what such animals used to be twenty years ago. There was, he added, in these days, too much breeding for pedigree, without considering what kind of animal was most useful. Had he been a breeder of any other kind of beasts than shorthorns he would certainly not hesitate to breed some of the Scotch sort, of which there were some fine specimens in the yard, especially a large black polled steer, shown by the late Sir Gordon Cumming's executors. That was a wonderful animal.

The CHAIRMAN, in giving the health of Lord Walsingham, as the winner of the cup for short-woolled sheep, expressed his determination to enter the lists with him again as a competitor in that department, adding that he hoped next year to have the pleasure of hearing his health proposed as the winner of the silver cup.

Lord WALSINGHAM, in returning thanks, observed that to have won any prize at such a show as that of this year was undoubtedly a great honour. Although that show was held under circumstances certainly not the most favourable, a great and terrible disease having only recently abated, and uncertainty having existed almost up to the last moment as to whether the show would be held, yet he might congratulate them on their having an exhibition which he believed had seldom, if ever, been excelled even by any show of the Smithfield Club (Hear, hear). The noble duke had made some observations respecting the success which he (Lord Walsingham) had this year obtained as an exhibitor of short-woolled sheep. He remembered that not many years ago, in the time of their Chairman's noble father, whom they all so much loved and respected (loud cheers)—he well remembered that in those days he was glad to pick up only a few crumbs which had been left by the Goodwood flock (laughter); and if he were now able to meet his noble friend the present Duke upon something like an equality, it was a matter of considerable gratification to him (Hear, hear). He took up his noble friend's challenge, and he told him that he should relax no effort, but should endeavour, by the same patience and perseverance that had been exercised in making his flock what it was, to make it, if possible, still better (cheers); though he was not vain enough to believe that the day would not come when he would fall from the step in the ladder which he had reached, when the noble Duke and the Goodwood flock would take their own again, and other exhibitors would come into successful competition with him. This year had been a year of triumph for the cross-breeds. If, however, he might give a little advice to cattle breeders in general, it would be not to forget the pure breeds (Hear, hear). He did not deny that cross-breeds had very great merits, and undoubtedly many of the cross-breed animals established this year had an enormous quantity of meat, and were very likely to be useful to the butcher; but let it be recollected that unless they had pure breeds to cross from they could not expect to maintain permanent excellence.

Lord BERNERS, in proposing the health of his Grace the President, expressed the pleasure which he felt of seeing him following the footsteps of his father, bearing as he did the honoured name of "Richmond" (cheers).

The toast having been drunk with great cordiality,

The CHAIRMAN said he should indeed be wanting in the commonest gratitude, were he not to feel deeply the honour which had been conferred upon him by the reception given to the toast, as well as the terms in which it was proposed by his noble friend. He was well aware that, following as he did in the steps of one who presided so ably, and for so many years, over that Club, he had a very difficult task to perform—in one sense of the word difficult: but he felt that in another sense of the word he had an easy task, because he had only to follow the example set by his father, to ensure his not being very far wrong (cheers). When he looked on the medal conferred on the successful competitors, he saw the impress of one who had been most dear to him, and he felt that he had, so to speak, if they would forgive him for saying so, an hereditary right to this position which at that moment he had the honour to fill ae their President (Hear, hear). He could assure them, therefore, that it was no mere words when he told them that he did feelc highly honoured at having been selected as their President. Bound up as he was with the agricultural body in the North and in the South, and everything he possessed in the world depending on the prosperity or want of prosperity of the agricultural interest in this country, it could not be consideredt an odd thing that he should feel that every subject thatp had to do with the prosperity of farmers was most intimately connected with his own prosperity (cheers). He had the satisfaction in the North of presiding over a happy and prosperous tenantry. He had the further satisfaction in the South of presiding over a tenantry as comfortable and happy as the people upon any estate in the country (Hear, hear). And he believed that they had been brought into that condition by one who had gone before him; and it was his earnest endeavour, and had been as long as he lived, to avoid all schism between himself and his tenantry; and those over whom he had the good fortune to find himself placed should in future years and as long as he was spared continue the same happy and united family (cheers). He must apologize to them for having been guilty of this digression; but the mention of his father's name called to mind so many recollections of the past, in connection not only with this Club, but the tenantry of the country at large, that he had been led away rather in a discursive strain from the toast. He had inherited a large, and he hoped and believed a good flock; and it should be his endeavour to keep up that flock, if possible, to the point of excellence it had undoubtedly attained (Hear, hear). Possibly his noble friend, Lord Walsingham, would say that he must do more than that, that he must make it still better or it would be no good. Well, he agreed with his noble friend, and would endeavour to do so (cheers). Frequently he had been told, "Yes, the Southdown sheep! He is a very nice article on the dinner-table, but he is a small animal, after all: you cannot get him any size." His answer to that was, "Go to the Smithfield Show (cheers). There I have three pens of Southdowns, and they average 284lbs. each (Hear, hear). If that is not size enough, then I am sorry for you" (loud cheers). And they were large enough for anybody, and especially were they large enough for the land for which they were adapted; and as they ought not to attempt to breed Leicesters on land adapted only for Southdowns, so they ought not to attempt to breed Southdowns on land adapted for Leicesters (Hear, hear). He believed, therefore, that if they were contented, in the various localities in which they were placed, to bring to the highest perfection an animal, be it bullock, sheep, or pig, that was best adapted for the district, they might be sure that they were conferring a benefit on the community. It would be as ridiculous for him, in his part of the world, to attempt to bring the Leicester sheep to the same state of perfection that his friend Mr. Torr succeeded in doing in his district, as it would be for Mr. Torr to attempt to bring out the Southdown sheep in the same state of perfection as he (the Duke of Richmond) had done. In conclusion, he could assure them that with the termination of his year of office his interest in the Smithfield Club would not cease. On the contrary, he hoped on many occasions to have the pleasure of meeting the gentlemen around him in the show-yard and at the dinner-table, and, more than that, he hoped to be able to carry away many prizes (loud cheers).

Lord WALSINGHAM next proposed the health of the President-elect for the year 1867, Major-General the Hon. A. N. Hood (loud cheers), and in doing so the noble lord spoke in flattering terms of the stock shown by the hon. and gallant gentleman as the representative of Her Majesty the Queen.

Major-General HOOD returned thanks. Speaking as the representative of Her Mejesty he said that she took the greatest interest in everything that appertained to agriculture (cheers). He might mention, as an interesting fact, that very recently Her Majesty visited both the Norfolk and Flemish farms for the purpose of seeing the beasts that were coming up for exhibition at the meeting of the Smithfield Club, and that he had had the gratification of telegraphing to her that some of these animals had been successful (cheers). On a former occasion his friend Mr. Torr had suggested the expediency of substituting a luncheon at the Agricultural Hall for this annual dinner. He did not know whether Mr. Torr had changed his opinion, but certainly the dinner to-day was a very good one, and they had met in an excellent room (loud cheers).

Mr. OWEN WALLIS proposed the health of the Vice-Presidents, and Lord Berners responded to the toast.

Mr. J. HUDSON, in giving "The Trustees of the Club,' said the first was a gentleman who rode straight across country, Mr. Charles Barnett (cheers); the next was a man who roduced the sheep that made mutton for the million, Mr.

Samuel Druce; and the third was a person who did everything well, Mr. Wm. Torr (loud cheers). He need say no more to induce them to fill their glasses bumpers and drink to the health of the trustees.

Mr. C. Barnett, in returning thanks and alluding to the compliment paid him by Mr. Hudson, said that with advancing years he found that riding straight across country did not present the same attractions that it did at an earlier age. He was still, however, a lover of fox-hunting; for he believed that it created kindly feelings between man and man, promoted intercourse between landlords and tenants, and was admired by the community generally. In proof of the latter observation, he might add that he was at the death of a fox the other day when the inhabitants of a whole village turned out, and manifested their interest in the sport by cheering the huntsmen (cheers and laughter).

Mr. Torr then proposed the health of the Judges, and animadverted on the leading features of the Show. As a whole, he said the Show was an extremely good one, taking into account the very unfavourable circumstances under which it was held. It was not quite so numerous as it had been the last two or three years; but it was not the mere number of entries in the aggregate, but the number of fair specimens of the various breeds of stock, that made the Show. Of course this was only his own opinion. As regarded the relative merits of the shorthorns and the cross-breds, the latter were entirely adapted to a colder climate and a harder mode of living than the former, and fattened at a later age; whilst the shorthorns were better adapted for a milder climate, and fattened at an earlier age. General Hood had been good enough to speak of the views which he (Mr. Torr) had expressed on a previous occasion respecting the dinner. All he could say on that subject was that he still held the opinion that it would be more popular if they had a luncheon instead, immediately at the close of the judging; but if it were the general wish to continue the annual dinner, they would always find him amongst them, perhaps talking nonsense ("No, no," and laughter).

Mr. Turner, one of the judges of short-wool sheep, responded. He had attended the shows of the Club for very many years, and he ventured to say that there were few gentlemen in the room who could remember seeing a better class of short-wools than the Southdowns were this year (Hear, hear). At previous exhibitions they might have seen now and then a pen that was superlative, whilst the rest were comparatively inferior. On this occasion, however, all the classes generally were good, and neither the noble chairman nor his late father had ever exhibited a better pen of Southdowns than was the pen of three old wethers in the showyard from the Goodwood flock (Hear, hear). Lord Walsingham's young sheep were deserving of everything he could say of them, and those of Lord Sondes, the Earl of Radnor, and several others were very fine. The judges, in consequence of this evenness in quality, had had considerable difficulty in selecting the best; and although it had been his lot many a time to act as a judge, he never experienced greater difficulty in deciding than he did in several cases this year. This difficulty was also met with in comparing the Shropshires and the cross-breds. He hoped to witness the competition between the Duke of Richmond and Lord Walsingham for many a year to come. Each would have something to do to beat the other, and the battle would be a hard-fought one. In conclusion, Mr. Turner gave the health of the "Stewards."

Mr. J. Ellman acknowledged the compliment.

The next toast was the "Honorary Secretary," which was proposed by Mr. C. Howard, who, in doing so, said that if ever he should be fortunate enough to win the Cup he only hoped that he should be above indulging in such ill-natured remarks on his competitors, as had that evening characterised the speech of Mr. Stratton.

Mr. Brandreth Gibbs, after a brief response, gave "Continued success to the Agricultural Hall Company."

Mr. J. Clayden, chairman of the Company, returned thanks.

Mr. J. Howard proposed the "Royal Agricultural Society of England," and remarked that landowners, tenants, and manufacturers must feel interest in a Society which was formed for the purpose of raising the standard of British agriculture. When they reflected on the great progress which had been made in the art of agriculture during the last 20 years, very much of which was owing to the Royal Agricultural Society, they could not but admit that that Society had been most successful, and that the farmers of England and all classes interested in the prosperity of the land were laid under deep obligations to it (cheers). No doubt the Society had fallen short in some things. Perhaps it was very much in the same position as many gentlemen around the table; it had done many things that it ought not to have done, and left undone many things it ought to have done. On the whole, indeed, they must admit, when they contemplated the great advance that had been made, that they were mainly indebted to the operations of the Royal Agricultural Society for the exalted position which British agriculture had attained. Opposite him he saw on the wall the motto of the Society, namely, "Practice with Science." Every one seated at that table knew that the "practice" of agriculture had advanced considerably in this country; and he believed that the "science" of agriculture had kept pace with the practice (Hear, hear). And perhaps he might be forgiven the expression of a hope that the Royal Agricultural Society would always keep its motto in mind, and never forget that both the practice and the science of agriculture were progressing (Hear, hear); that it would not jump to the conclusion that perfection had been reached; for as sure as a society or an individual, a manufacturer or a farmer, came to the conclusion that perfection was attained, from that moment retrogression commenced (Hear, hear). In the room where they were then assembled, he told the Farmers' Club, a month ago, a few things in respect of which their cousins across the Atlantic were in advance of the agriculturists of this country. He was not going into the subject again. What he stated was before the world in print, and he hoped the lesson it gave would not be lost upon the Royal Agricultural Society of England (loud cheers).

Mr. Robert Smith, having replied for the Council of the Royal Agricultural Society, concluded by proposing the health of the "Butchers."

The Chairman then gave the toast of the "Labourers," and when this had been drunk the company separated.

THE SMITHFIELD CLUB.

THE IMPORTATION OF FORAGE.

On the Thursday morning a meeting of graziers and agriculturists was held in the board-room of the Agicultural Hall on the subject of the cattle plague, but more especially to protest against the importation of hay while cattle are known to be in a diseased state, it being held that such importation is a fruitful source of disease.

Mr. W. Torr, who presided, said the meeting had been convened at the instigation of a number of gentlemen connected with agriculture, who felt that some protest ought to be made to the Government against the importation of foreign forage from the Continent. Hay was continued to be imported from Holland in large quantities, although the cattle plague was known to be raging there worse than it had been in this country, and it was considered that the Government should be called upon to put a stop to so glaring an inconsistency.

Mr. Stephenson said there was a large number of gentlemen present from the north, who were prepared to show that whilst the importation of foreign cattle was prohibited, large quantities of Dutch hay was almost daily landed at Leith from Rotterdam. Here was the gross anomaly. So particular were we at home, in order to prevent the spread of the cattle-plague, that hay was prohibited from removal even from one district to another in England. Yet Dutch hay and other forage, subject to the droppings of the cattle in Holland, where the plague raged fearfully, and which, no doubt, therefore, contained the virus of the disease, was permitted to be imported without restriction. The reason this hay was patronized was that it was obtained at from £1 and upwards per ton less than good wholesome English hay.

Mr. Dunn read a protest which had been drawn up by agriculturists of the north on this subject, and ridiculed the restrictions put upon the importation of Dutch cattle and hides, if this importation of hay was permitted.

Mr. Randall offered similar views, and moved a resolution to the effect that a representation be forthwith made to the Privy Council urging that the Government should immediately make such regulations as would prevent the importation of hay and straw or other forage from any foreign countries known to be afflicted with the cattle-plague. He remarked that the Dutch agriculturists sent their forage here, as they had but few cattle of their own to eat it.

The resolution, having been duly seconded, was carried unanimously.

METROPOITAN CATTLE MARKET.

THE GREAT CHRISTMAS SUPPLY.—Dec. 17.

Notwithstanding the severe losses sustained this year from the cattle plague, and the large sales of half-fat animals disposed of by the feeders in the early part of the season, there was a full average number of Beasts on offer here to-day for Christmas consumption. Fortunately for the graziers, this has been a favourable year for the production of live stock. Although since the third week in August considerable quantities of rain have fallen in most parts of the United Kingdom, natural food has been very abundant, the root crops have turned out wonderfully heavy, and both Beasts and Sheep have been kept longer upon the land than usual. The graziers' expenses have thus been lessened, and there is an abundance of good food on hand for winter use.

For numerical strength the Shorthorns here to-day stood first. This noble breed, which has extended itself in all parts of the country for breeding purposes, came to hand in excellent condition, and in large force, considering the large numbers sold at a much earlier period than in the usual run of years. Some of the Beasts weighed upwards of 200 stones, and realised high quotations in spite of the restrictions still placed upon the removal of stock from this market to distant localities.

We may next place the cross-breds in the category of excellence. There were crosses between the Shorthorned Bull and the Ayrshire Cow, between Shorthorns and Scots, bred and fed in Norfolk, Suffolk, and Cambridgeshire, and, indeed, between almost every other breed in the kingdom. With some few exceptions, where the very best animals had not been used, the show in this respect was wonderfully good. The points of the animals were well preserved, and the weight of meat was fully equal to any former year.

The Herefords stood next. This splendid breed exhibited points of great excellence, and elicited great praise from the butchers. The prices realized for them were about on a par with the general run of good crosses.

As regards the Devons, we may observe that they came to hand in excellent condition. The supply, however, was only moderate, not from any scarcity of stock in the West of England, but from the unwillingness on the part of the graziers to forward largely during the continuance of the present restrictions upon the movement of stock to the provinces. High rates were paid for them in every instance.

There was a most splendid exhibition of Scots and Crosses from Scotland and Norfolk. The Scotch cattle especially were unusually good. The Norfolks were larger in size, taken collectively; but the Scots, from Scotland, had quite as much consumable meat on their backs as their more stately rivals. There was very little difficulty in finding a ready sale for this portion of the supply. The number of polled Scots brought forward was rather limited. Their quality and condition, however, were very prime.

Of Sussex Beasts there was a fair arrival; but most of them ranged from six to seven years old, consequently did not command much attention.

There were some very good Welsh runts on offer; but the Irish bullocks were deficient in quality.

Mongrel breeds were somewhat more numerous than could be desired. The long-horns were very few in number; but most of them were of full average weight.

With this general outline of the show, we now direct attention to the more salient points of the supply.

The following return shows the number of Beasts exhibited, and the prices realized for them, on the great days during the last twenty-five years:—

Years.	Beasts shown.	Prices.				
		s.	d.		s.	d.
1841	4,500	3	8	to	5	0
1842	4,541	3	4	to	4	8
1843	4,510	3	8	to	4	4
1844	5,713	4	0	to	4	6
1845	5,326	3	6	to	4	8
1846	4,570	4	0	to	5	8
1847	4,282	3	4	to	4	8
1848	5,942	3	4	to	4	8
1849	5,765	3	4	to	4	6
1850	6,341	3	0	to	3	10
1851	6,103	2	8	to	4	2
1852	6,271	2	8	to	4	0
1853	7,037	3	2	to	4	10
1854	6,181	3	6	to	5	4
1855	7,000	3	8	to	4	2
1856	6,748	3	4	to	5	0
1857	6,856	3	4	to	4	8
1858	6,424	3	4	to	5	0
1859	7,560	3	6	to	5	4
1860	7,860	3	4	to	5	4
1861	8,840	3	4	to	5	0
1862	8,430	3	4	to	5	0
1863	10,370	3	6	to	5	2
1864	7,130	3	8	to	5	8
1865	7,530	3	4	to	5	4

At Mr. George Dickson's stand there was a large collection of Scotch Beasts, which attracted much attention. Some of the best Scots and crosses were forwarded by Messrs. Knowles, Martin, Wishart, Biddie, Read, Winner, Frost, Bruce, and other graziers of Aberdeenshire; and by the Messrs. Longmore, Mr. Stodard, and others of Banffshire.

Messrs. Maidwell and Hoyland exhibited some very prime animals, the property of Mr. Reid, of Greystone, Vale of Alford; Mr. Martin, of Aberdeen, and various other graziers.

Mr. Vorley's stand was well filled with remarkably good stock, from various counties.

Mr. Hicks's stand was well filled with some wonderful stock, consigned by the leading graziers in Scotland.

Mr. Duckworth had some excellent Beasts, which realized good prices. One bullock was offered for sale which had been exhibited in the show-yard.

Various other lots of prime Beasts were brought forward: amongst them were some remarkably good Beasts, the property of Mr. M'Combie, of Tillyfour, Aberdeen.

Taken as a whole, the supply of Beasts was quite equal to most former years, both as regards weight and quality.

The quality and condition of the Sheep were good. Mr. Gurrier had on sale some very good Cotswolds, bred by Mr. Hewer, of North Leach.

Mr. Dodd had a good show of Downs and half-breds, forwarded by John Walter, Esq., of Barewood; Messrs. Deane, Righton, F. Dodd, and Healey.

Mr. Lintott's stand was well filled with prime Sheep, the property of Mess. Cox, Bates, Latimore, St. Albans, and Holgen, of Chichester. Mr. Drewett, of Guildford, sent some very fine stock.

Mr. Still had four very fine Downs belonging to Mr. Canning, of Elston, Devizes.

Mr. Eland had some very prime Lincoln Sheep, belonging to Mr. J. H. Casswell, of Laughton, Folkingham.

Mr. Weall, Mr. Burrell, Mr. Starkey, Mr. Caton, and Mr. Corfe had some very good Sheep on offer.

STATE OF THE TRADE.

The supply of Beasts being very large, and of excellent quality, the sale for all breeds was in a sluggish state. The absence of the usual number of country butchers operated against the demand. A few very superior animals sold at 5s. 6d. per 8lbs., but this price was by no means general. The best large Oxen produced 5s. 2d. per 8lbs.

The arrivals from Lincolnshire, Leicestershire, and Northamptonshire were about 2,200 Shorthorns, &c.; from other parts of England, including Norfolk, 1,600 Scots, &c.; from Scotland, 1,000 Scots and crosses; and from Ireland, 700 Oxen, &c.

The show of Sheep was very moderate, but most breeds came to hand in good condition. The demand for all breeds ruled steady, at an advance in the quotations of 2d. per 8 lbs. The best downs and half-breds sold at 6s. 4d. per 8 lbs.

Calves were in moderate supply, and fair request on former terms, viz., from 4s. 8d. to 5s. 10d. per 8 lbs.

In Pigs, the show of which was good, very little was passing, at the late decline. The top figure was 4s. 6d. per 8 lbs.

Per 8lbs., to sink the offal.

	s.	d.		s.	d.
Coarse and inferior Beasts…………	3	8	to	3	10
Second quality ditto ………………	4	0		4	8
Prime large Oxen ………………	4	10		5	2
Prime Scots, &c.………………	5	4		5	6
Coarse and inferior Sheep…………	3	10		4	2
Second quality ditto ………………	4	4		5	0
Prime coarse-woolled ditto ………	5	2		5	10
Prime Southdown ditto ……………	6	0		6	4
Large coarse Calves ………………	4	8		5	4
Prime small do. ………………	5	6		5	10
Large Hogs ………………	3	6		4	0
Neat Small Porkers ………………	4	2		4	6

Suckling Calves 20s. to 23s., and Quarter-old store Pigs 27s to 30s. each.

HEAD OF CATTLE ON SALE TO-DAY.

[FROM THE BOOKS OF THE CLERK OF THE MARKET.]

TOTAL SUPPLIES.		FOREIGN SUPPLIES.	
Beasts ………………	7,340	Beasts ………………	2,150
Cows ………………	—	Cows ………………	—
Sheep………………	19,120	Sheep………………	3,640
Calves ………………	200	Calves ………………	193
Pigs ………………	310	Pigs ………………	40

IMPORTS INTO LONDON LAST WEEK.

FROM WHENCE.	BEASTS.	SHEEP.	LAMBS.	CALVES.	PIGS.
Aarhus ……………	9	11	—	—	—
Antwerp ……………	72	3773	—	109	—
Boulogne ……………	293	—	—	26	—
Bremen ……………	1	—	—	21	1
Calais ……………	—	—	—	21	—
Deauville ……………	150	—	—	30	—
Hamburg ……………	291	114	—	—	—
Harlingen …………	470	—	—	14	7
Ostend ……………	—	—	—	38	—
Rotterdam …………	—	—	—	—	117
Total ……	1286	3898	—	259	125

COMPARISON OF THE "GREAT DAYS."

STATEMENT SHOWING THE SUPPLIES AND PRICES OF FAT STOCK EXHIBITED AND DISPOSED OF ON THE "GREAT DAYS" IN 1865 AND 1866.

	1865.						1866.				
	s.	d.		s.	d.		s.	d.		s.	d.
Coarse and inferior Beasts	3	4	to	3	8	……	3	8	to	3	10
Second quality ditto ……	3	10		4	6	……	4	0		4	8
Prime large Oxen ………	4	8		5	0	……	4	10		5	2
Prime Scots, &c. …………	5	2		5	4	……	5	4		5	6
Coarse and inferior Sheep	4	0		4	8	……	3	10		4	2
Second quality ditto………	4	10		5	6	……	4	4		5	0
Prime coarse-woolled ditto	5	8		6	2	……	5	2		5	10
Prime Southdown ditto …	6	4		6	8	……	6	0		6	4
Large coarse Calves ……	4	0		4	6	……	4	8		5	4
Prime small ditto ………	4	8		5	0	……	5	6		5	10
Suckling Calves ………	19	0		22	0	……	20	0		23	0
Large Hogs………………	4	0		4	6	……	3	6		4	0
Small Porkers ……………	4	8		5	2	……	4	2		4	6
Quarter-olds (each)………	30	0		33	0	……	27	0		30	0

SUPPLIES ON SALE	Dec. 18, 1865.		Dec. 17, 1866.
Beasts ………………	7,530	…………	7,340
Sheep ……………	24,810	…………	19,120
Calves ……………	12	…………	200
Pigs………………	370	…………	310

LIVERPOOL FAT STOCK SHOW.

The Liverpool show of cattle, sheep, and pigs was held on the 12th and 13th December, at Stanley, and brought together a very fine display in all departments. There were eleven classes of cattle, three of these being for Irish stock, and the total entries 51; nine classes of sheep with 41 entries, and three classes of pigs with 24 entries. The principal prize for oxen was awarded to Mr. R. H. Harris, Earnhill, Forres, Elgin, for a cross-bred shorthorn-and-polled ox. To this animal, in addition to the prize of its class, was awarded a subscription silver cup, value ten guineas; it was sold to Mr. Archer, a Liverpool butcher, for £60. For shorthorn oxen Messrs. J. and W. Martin, Newmarket, Aberdeen, took the first prize; for Scotch polled oxen Mr. W. M'Combie, Tillyfour, Aberdeen; for cross-bred oxen Mr. R. H. Harris took both first and second prizes; for Highland oxen Mr. James Stewart, Newmarket, Aberdeen, took first and second prizes; for Hereford oxen Mr. Barwell Ewins Bennett, Marston Trussel-hail, Northampton, took both prizes; for shorthorn cows or heifers Mr. James Stewart took both prizes; for Scotch polled cow or heifer Mr. James Reid, Alford, Aberdeen, was awarded first prize; for cross-bred cow or heifer Messrs. J. and W. Martin took the first prize; for Irish oxen Mr. T. St. G. Pepper, Ballygarth Castle, Meath, took both prizes; and for the best Irish ox, cow, or heifer Mr. Matthew Stubbs, Litherland, Lancashire, obtained first prize. For sheep Mr. Edward Crawshaw obtained first and second prize for Leicester and long-woolled wethers, and also the subscription silver cup, value 5 guineas. Mr. Barwell Ewins Bennett also took a first prize for Leicester and long-woolled sheep. Mr. William Yates, of Grendle House, Shiffnal, Salop, took both prizes for Shropshire and other Downs; Mr. J. M'Gill, Kirkcudbright, first two prizes for Cheviot wethers; Mr. George Coulthard, Cumberland, for Cheviot and Leicester half-breeds; Mr. A. G. Sproat, Wigtown, first prize for Scotch black-faced half bred with Leicesters; Mr. James Stewart, both prizes for black-faced Highland wethers; and Mr. Allan Pollok, Galway, first prize for Irish wethers. For pigs Mr. Thomas Atherton, of Speke, Lancashire, obtained first prize for a small-breed pig, and with the same animal the subscription silver cup, value 5 guineas. The Earl of Derby took second prize in this class. Mr. James Birch, Sefton, Lancashire, obtained first prize in the middle-breed class; and Mr. James Harding, Priory, Bootle, Lancashire, the first prize in the large-breed class.

"FORBIDDEN TOPICS" AT THE ROYAL AGRICULTURAL SOCIETY.

The spirit with which the proceedings went off during the Smithfield week, the full attendance at almost all the meetings called, and the gross receipts at the doors of the Agricultural Hall, all tend to prove the vitality of our cattle shows. There was a peculiar zest given to the occasion, a keener sense of enjoyment observable, and a thorough determination evinced to make the most of the opportunity. This is the more significant, as farmers have of late had but a bad time of it; and many a man, had he so desired, might have framed a very reasonable excuse for not coming to London. There were doubts up to the very last as to the Show being held; many of the leading exhibitors had nothing to enter, and a variety of other collateral causes existed which might have conduced to a thinning down of our visitors. But the contrary, we repeat, was the case. Whether at the gatherings of the Royal Agricultural Society, of the Smithfield Club, or of the Farmers' Club, there have not for many years been so many people present. The Salisbury Hotel, as the head-quarters of Agriculture, might have been filled four or five times over, and the annual meeting of the Royal Agricultural Society brought so many members together, that seats were at a premium, and the two rooms amply occupied. At something of a crisis in the fortunes of the Society, this may be very fairly regarded as the great demonstration of the week, and it was clear that no little interest was felt for the future of our national institution. The business opened with the reading of the Report, from which, as usual, little or nothing could be gathered, as in plain truth the composition of this paper was in places little less than disgraceful to all concerned in its production. The chief aim appeared to be, to say as little as possible in the greatest number of words, and to dwell over the most trifling topics. But we scarcely dare trust ourselves to speak to the merits of this precious document, and we shall, consequently, prefer to give our readers the opinion of our contemporary the *Gardeners' Chronicle*, an expression, be it said, in which we heartily concur: "It was nothing less than startling to ourselves, and no doubt to many others also, to find that among the leading agricultural facts of the year recorded in the Report read last Wednesday is the important announcement that F. Chubb, E. King, and W. Mortimer had won £4 at a recent examination in pure mathematics; and that Hill, Mackwood, Rudd, and many others, had won similar distinctions at recent examinations into their general educational attainments. We read also that these young gentlemen were educated at Clevedon College, Abington House, and the Devon County School; and nearly one-half the Annual Report of the Council of the Society is taken up with announcements of this kind." After going on to declare that but for the serious side of the subject, such a statement in such a place would be "simply ludicrous," the article concludes in this wise: "What the sanguine educational movement led by Mr. Acland and permitted by the Council has hitherto accomplished may be seen in the grotesque absurdity of the fact that in their annual address to the great national agricultural interest for the year 1866 there is positively more said about the £5 prizes won by a lot of schoolboys than there is about the Cattle Plague!" Would it really not be well, as is the habit with other Societies, that copies of the Half-Yearly Report should be obtained on application for fourteen days previous to the Meeting, and then Members would be prepared to speak to the several points placed before them, instead of the Report being received and adopted, as was the case on Wednesday, without a word of reference to its contents or purport? The President, however, supplied the deficiency. It, in fact, would almost look as if the Society's Report was rendered designedly dull in order that the President's address might become the more piquant. Mr. Thompson, as previously announced, read an elaborate treatise on the Past and Present of the Royal Agricultural Society, which was listened to with marked attention, and pronounced by many of the succeeding speakers to be an "admirable" exposition. For our own part we cannot share in this high estimate of the oration; as, to our thinking, Mr. Thompson appeared as often inclined to make the most of trifles, to the sacrifice of more important topics, as the unhappy Report which acted as the overture to his own more pretentious performance. The very opening sentences of the speech gave utterance to something like a sneer. As chairman of the Journal Committee, it seems that Mr. Thompson has frequently been urged to procure articles on such questions as Leases, Tenant Right, the Preservation of Game, and other such "forbidden topics"; but upon this he says, "Nothing can be more reasonable than that men who have a common interest in any subjects of this nature should meet and discuss them—should, if they think fit, write pamphlets and newspaper articles, and endeavour as much as possible to enlist public opinion in support of their particular views"—and so forth. Of course they can, without any particular leave or licence, as we take it, from the President of the Royal Agricultural Society, whose own speech was a pamphlet or a newspaper article, specially written out, as he himself said, previous to delivering it, in order that the newspapers might have it in full. But why are leases or the game abuse forbidden topics? "Because," answers Mr. Thompson, "when all is done, landlord and tenant must in future, as in the past, settle their mutual rights and privileges by individual negotiation and agreement; and in the great majority of cases such negotiations will assuredly end in land being let at its market value, such market value varying in some measure according to the security afforded to the tenant that if he lays out his capital on land that is not his own he will get it back with a fair profit;" which, being interpreted, means to say, so far as we can understand the rather dubious phraseology in which the sentence is worded, that discussions, or pamphleteering, or newspaper articles, on such forbidden topics, are of little or no actual use after all. Fortunately, every one knows the reverse to be the fact, and that of late years the clauses in leases have been improved, the security of capital has been ensured, and the evils of game-preservation have been diminished proportionately as these matters have been discussed or written up to. But in any case, says Mr. Thompson, such topics as Leases and Tenant-right are forbidden in the *Journal* of the Society. We beg to demur even to the statement of so high an authority as Mr. Thompson, and in doing so to take him back to a still higher. In the earlier history of the Royal Agricultural Society, when its Journal was conducted with an ability that it never has been since, Tenant-Right and Leases were *not* forbidden subjects in its pages; on the contrary, they were well known to be two of the favourite topics of Philip Pusey, feeling as he did how much the agriculture of the country and the proper position of the farmer depended upon these questions being properly adjusted, through the force of public opinion, or even, if you will, through the interference of the Legislature. And what does Mr. Thompson set up against such subjects as these, as being more worthy of the consideration of the Royal Agricultural Society? Education, Agricultural Farm Buildings, and Labourers' Cottages. If Education be an adherence to the absurdities paraded in the Report of the Society, then God help the agricultural pupil! As to farm-buildings, why the tenant's right to pull down the buildings he had himself erected was conceded as the result of this very tabooed Tenant-right inquiry. And then the labourer, and his cottage, and his cow?—his audience was too well bred to laugh in his face when Mr. Thompson recommended the farmers of England to sub-let their grass-lands to the labourers to keep cows and pigs upon! But we do not believe there was a man in the room who ever thought for a moment of following such advice. And these are the topics that the Great National Society of Agriculture should engage itself upon—to carefully provide for Pollard getting his £7 as the head of "the General Class," and for Bran renting as much grass land as will keep him a cow and a pig! All this may be very admirable, as some gentlemen declared it to be; but we emphatically protest against the condition to which the Royal Agricultural Society is being brought, when it dare not treat on topics of all others most important to the actual business of farming, and that, perhaps the best friend the Society ever had, declared by his practice to be above all others most worthy of attention.

We are quite willing to allow that Mr. Thompson made the most of the cattle-plague, and of the very little the Council has hitherto done in dealing with that matter; but the general tone of his pamphlet struck us as being eminently conservative or obstructive, for we need not stay to search for phrases. There can be, indeed, little wonder that the Council is so ready to shift over the real care of the cause to the New Chamber, or to any one who will take it, when the Tenure of Land is proclaimed as a "forbidden topic" in a community of agriculturists!

THE ROYAL DUBLIN SOCIETY'S CHRISTMAS SHOW.

This exhibition was held in the Society's premises, Kildare-street, on Tuesday, Dec. 11, and the two following days. The number of entries in the different sections was considerably less than on former occasions, partly in consequence of the apprehensions which existed until a recent period concerning the outbreak of the cattle-plague, and partly from the Society not having determined on holding the show in time to enable the exhibitors to prepare for the contest.

In the section for the best Shorthorned ox calved in 1864 the prize was awarded to Mr. Allan Pollok, for a roan bullock with a good rib and back. The prize for the best ox more than two years old was also given to Mr. Pollok, for a very evenly-fleshed animal, with capital hips, and good rib and chine. In the section for the best West Highland ox, of any age, there was no competition, the prize being awarded to Mr. Allan Pollok for a very fine beast, with grand back and loin, and a capital chine. Mr. Pollok also carried off the prize for the best Scotch polled cow, of any age, with a rather nice animal. The prize for the best Hereford cow was won by Mr. R. Featherstonhaugh with a very well-finished cow, with splendid hips, rib, and loin. In the section for the best cow of any age or breed, the prize went to Mr. Mark Leonard, for a nice Shorthorn, with prime chine and loins. The prize for the best Shorthorn heifer, under forty-eight months old, was won by Mr. Pollok with a splendidly-finished heifer, with fine sirloin and rib. In this class a heifer belonging to Mr. Nathaniel Barton was commended. In the Kerry heifer class the prize was awarded to Mr. N. Barton, for a beautiful evenly-covered heifer, with good round; and in the same section Mr. Sam. Garnett, jun., received a high commendation for a nice heifer, with good rib and chine. The prize for the best heifer, not included in the foregoing sections, went to Mr. A. Pollok, for a heifer with good back and rib, and capital round. In the class for the best pair of outdoor and grass-fed heifers the prize went to Mr. Thomas Gerrard. There were only five other lots shown.

The number of entries of sheep was also small. Those shown were, however, very good. The prize for the best pen of three Long-woolled shearling wethers went to Mr. J. S. Naper, for a capital pen of well-finished wethers, a very nice pen belonging to Mr. John Radcliff being commended. In the pen of three Long-woolled shearling wethers, exceeding one and not exceeding three-shear, the prize was awarded to Mr. Thomas Gerrard, for a capital pen of sheep, which were fed solely on grass, without any artificial food whatever. Mr. James Simpson was highly commended for a pen of Leicesters; and a very fine pen belonging to Mr. A. Pollok was commended. There was also a pen of very fine wethers shown by Mr. Richard Walsh, which appeared not to have been noticed by the judges. The prize for the best pen of three long-woolled shearling ewes, of any age, was given to Mr. William Owen for a very fine pen of Leicesters; a pen belonging to Mr. Seymour Mowbray being highly commended, and another belonging to Mr. Pollok being commended. In the section for the best pen of three short-woolled shearling wethers there was but one exhibitor, Mr. J. S. Naper, who received a certificate of merit for a nice pen of Shropshires. In the class of three short-woolled shearling wethers, exceeding one, and not exceeding three-shear, there was but one exhibitor; and no prize was awarded. The prize for the best pen of three long-woolled shearling ewes, of any age, was awarded to Lieutenant-Colonel Tottenham, for a very good pen of Shropshire Down ewes. Mr. Samuel Garnett carried off the prize for the best pen of five sheep, of any age, sex, or breed, not competing in the foregoing sections, with a very fine pen, fed on nothing but grass. In this section, Mr. Allan Pollok received a highly commended card; and a pen of Leicesters belonging to Mr. James Simpson was commended.

In the swine classes the entries were small, but the animals shown were very good. In the section for the best pen of three pigs, coloured breed, under six months old, there was a very nice lot of small Windsor, crossed with black Berkshire, shown by Captain Frederick J. Isaacke; but no prize was awarded, he being the only exhibitor. The prize for the best single pig, coloured breed, of any age, was awarded to a remarkably fine Berkshire sow, belonging to Mr. Richard Winter Reynell. Mr. J. L. Naper obtained the prize for the best pen of three pigs, white breed, under six months old, with a nice pen of Yorkshire and Cumberland pigs. The prize for the best single pig, white breed, any age, went to Mr. Daniel Bayley, for a very good hog of the white Yorkshire breed.

The number of entries in the poultry classes was very large; in fact, this was the only portion of the show that was at all equal in point of number to what it had been on former occasions. The Dorking classes were well filled, the birds exhibited being very fine. The principal prize-takers in Dorkings were Mr. R. Palmer Williams, Mrs. Warburton, and Mr. F. W. Zurhorst. The number of Spanish fowl shown was not quite so great as that of the Dorkings. The prizes here went to Mr. Alexander Conyers, jun., Mr. Seymour Mowbray, Mr. R. P. Williams, and Mr. Charles E. M'Clintock. The turkeys and geese were very fine. There were some beautiful Hong Kong geese shown by Mr. Thomas Butler.

The exhibition of agricultural produce was very creditable. The first prize in long red mangel was won by Lord James Butler with six roots, which weighed 126lbs.; second, the Marquis of Clanricarde. Lord James Butler also got the prize for long yellow; weight of six roots, 77lbs. In red globe mangel the prize was awarded to Lord James Butler; weight of six roots, 103lbs.; second, Lady Butler; weight, 102lbs. For the best yellow globe mangel the prize went to Mr. Thomas Smith; six roots, 92lbs. The prize in Swede turnips also was awarded to Mr. Smith for six roots; weight, 126lbs.

The show of butter was good, both as regards quality and entry. There were two sets of prizes in this class, one lot given by the society and the other by the hotel keepers of Dublin. Those given by the society were for cools, not less than 40lbs., and the prizes were awarded—first, to Mr. Michael Roche, Carlow; second, Miss C. Jones, Wicklow; third, Mr. N. Dowling, Wicklow; fourth, Mr. James Roche, Carlow. The hotel keepers' prizes went to the following: Mr. P. Hughes, Mr. J. Smith, Carlow; Mr. T. Bergin, Wicklow; Mr. Cecil, Wicklow; and Mr. H. Bolan, Wexford. There is a prize or certificate given to the dairymaid who shall have made the winning cool of butter. In this instance there were two awarded: first, to the dairymaid of Mr. Michael Roche; second, to Miss Jones' dairymaid.

The prize for the best collection of farm produce went to Mr. B. L. Guinness, M.P.; while in the wool section there were some excellent fleeces shown, but the prize for the best fleece of long wool was awarded to a cross-bred fleece, the length of staple of which was only about five inches; though there were splendid long-wool fleeces shown by both Dr. Taylor and Mr. Owen, the staple of which was remarkably fine, and fully nine inches in length.

THE TREDEGAR SHOW.

The Cattle-plague restrictions again kept away the Shorthorns and Herefords, as well as sheep and pigs; but there was a really good entry of horses of every age and sort, from the thorough-bred stallion to the rough, quick-stepping Welsh pony. The town of Newport was the customary head-quarters of the meeting, while the trial-ground for the hunters was in the meadows a mile begond Tredegar Park. The fences were in the figure of eight—easy, but sufficient to test the capability of a horse.

There were two classes of hunters tried, viz., those up to 14 stone and 11 stone respectively, who should prove themselves "good and straight fencers over such fences as may be selected; more than three refusals at any fence to be a disqualification." Amongst the weight-carriers The Pride of Erin was a regular Irishman in appearance, with fine shoulders, nice springy action, a good fencer, but to whom we should fancy 11 or 12 stone more suitable than 14. Goliah, a 17-hands 3 in. chestnut, had evidently been well-tutored, and did his leaps easily and well in the hands of his owner, the Honourable F. C. Morgan, whose other entry, Jamaica, by Maroon, equally well-handled, is a fine slashing mare, and looked more fit to sail along across Leicestershire than for an enclosed country, handy though she be. Patience, a strong, short-legged mare, looked like a real good sort, and did all her leaps, with the exception of the timber, well; but a large-capped hock would spoil her chance of a prize. Bantam, a six-year-old brown gelding, jumped well, and appeared to have a good turn of speed; but he twists his forelegs in galloping, and we should think would be likely to cut himself. Mountain Dew, a four-year-old black gelding by The Era, dam by Windhound, pleased us more than anything we had yet seen, having fine even action, and doing all his leaps in splendid form. He must, if all goes well with him, turn out a very valuable animal. Troublesome, a well-named, strong, common-looking chestnut, jumped well, barring the timber, where he nearly came to grief, the result, apparently of having a bad mouth, and throwing his head about in a most "troublesome" manner to his rider; he will, however, improve with age, we doubt not, in which case he will be a very useful horse. A big bay horse, called The Bishop, was the only one in this class who took a bath, which, however, was not of much consequence in his case, as the company he had to keep was evidently too good for him. Next came the horses calculated to carry 11 stone to hounds, with the same conditions as to their leaping capabilities as the former. Cabin Boy, by Morning Herald, reminded us of his grandson Chanticleer, and is a very showy nag—a great favourite in the neighbourhood from his performances. He did his fences in first-rate style, and galloped, in the opinion of many people, to perfection; though we nevertheless consider his action and general appearance more fit for Rotten Row than for the hunting-field; but, if we kept but one horse, we could very well put up with Cabin Boy. The brown Rarey, without a pedigree, was every inch a hunter in appearance—which his performance did not belie. Alice was a chestnut mare, that looked more like steeplechasing than hunting, and we heard that she has been pretty successful in that line. Col. H. Gore Lindsey's King of Sardinia is a nice, well-bred one, and, as well as his grey Seagull, a good performer. Young Mr. F. H. Beaver's chestnut, Kildare, is a nice sporting-looking nag, who evidently can jump anything, and it is a pity he was not mounted by someone who could ride him, as he refused several times simply from bad handling. Le Papillon, a four-year-old by Wild Dayrell, is too light for a 12-stone hunter; and the chestnut gelding Alma has a plain head, and short back-ribs, but he went well.

On Wednesday morning the show proper was held in the cattle market at Newport, three sides of which are surrounded by excellent stabling for the horses, and in which were ranged yearlings, two, three, and four-year-old hunting colts or fillies to be got by a thoroughbred horse, and bred in the counties of either Monmouth, Glamorgan, or Brecon; cobs, ponies, and cart horses, as well as the hunters that were tried on the yesterday—all of which were respectively before the judges, and afterwards paraded for the benefit of the general public. The judges were Major Lewis from Pembrokeshire, Mr, Barthropp from Suffolk, and Mr. Cookes from Worcestershire, for riding horses; and Mr. Higgins from Gloucestershire and Mr. Adams from near Chepstow for cart horses.

Beginning with the yearlings shown for Lord Tredegar's cup—seven entries—the winner, belonging to Mr. Thomas, St. Hilary, near Cowbridge, is a smart colt by Kildonan, but will never be up to much weight: his action no doubt got him the prize. Mr. Henry Dowell had a nice grey or black filly by Llandaff, which obtained a commendation. The two-year-olds, with twelve entries, were a mottley group, comprising the neat thoroughbred, one animal fit for a Brougham, one or two ponies, and some nondescripts. The winner, after a great deal of drafting, appeared in a strong chesnut filly, half-sister to Mountain Dew, being by Ancient Briton, dam by Windhound; but she is not so good-looking as the horse, having rather a plain head and short forehand; though her action was so superior to any of the others that it outbalanced the rather common look which at first struck you. The Hon. G. C. Morgan showed three very nice animals, but they were all too light; The Cadger, being the best of the lot, was commended; and the Hon. F. C. Morgan was also highly commended for his good-looking Wild Dayrell colt, which appeared to be in training. Three-year-olds: Six entries, the winner being a good old-fashioned sort of horse, with fine shoulders, and altogether the stamp we want more of. The Hon. F. C. Morgan shows a nice filly by Clapham, which is commended: the winner of this cup is by Caliph, and the property of Mr. W. Morgan of Llanvetherine. The cup for four-year-olds was won by Mr. R. Rees with a bay horse by Morpeth, having fine shoulders and a capital back, with good action; a black mare by Knight of Gwynn, being highly commended and very deservedly, being a fine promising mare in spite of a little slackness about the loin. The hunters, whose jumping powers were tested yesterday, were now brought up for judgment, the prizes being £20 and £5 for the best hunter up to 14 stone; and it is only necessary to say that Captain Heygate won with Mountain Dew, the Hon. F. C. Morgan's Jamaica taking the second place. The prize of 10 guineas for the best hunter up to 12 stone went to Mr. C. H. Williams' Rarey, notwithstanding its being pretty generally known that Cabin Boy was sold for £200 on the previous day; but he was only highly commended; and Mr. Holt Beever's Kildare and the Hon. J. F. Clifford Butler's Bella Donna were commended. The silver cup for the best thoroughbred entire horse from two years old upwards was awarded to Mr. Miles' Prince of Wales, a horse of fine outline, but whose action is evidently gone, from age; while Clapham, the commended horse, is all wrong in his back and action; the three other entries require no comment from us. The cup for the bast nag mare with foal at fool or in-foal brought out a very odd lot; but the winner, the property of Mr. T. P. Booker, was of a nice sort, and, as we were told, had been a good hunter. We were disappointed in the ponies, though there were ten entries: these were, however, soon reduced to four, and over these the judges dwelt a long time, there evidently being some difference of opinion amongst them; but at last the point was settled, the prize going to a nice dark-chesnut mare, belonging to Mr. J. Williams from near Cowbridge; the other three being commended. A prize of 5 gs. for the best cob or galloway brought the largest number of competitors, there being eighteen entries, though they were not so uniform a lot as might have been expected in the locality. After a deal of drafting, the preference lay between a very neat bay mare and a rather plain horse, whose action before was certainly better than the mare's, and which we suppose must have gained him the prize for his owner, Mr. R. H. Richards.

We had not time to pay much attention to the cart horses, of which the show was far from being good, there being but 29 entries, and but few of these requiring notice. The cup for the best yearling colt or filly was awarded to a strong useful colt of Mr. R. W. Bridgewater's. Five guineas for the best two-year-old was won by Mr. W. Blowers with a coarse-legged grey, whose shoes did not appear to sit comfortably on his fore feet, if we may judge from his manner in the stable. The prize for three-year-olds was won by Mr. D. Downes with a very useful animal. Mr. J. Logan wins the set of cart harness for the best working horse for agricultural purposes with a thick good mare. But one cart mare with foal at foot was shown, still she was a fine one. The stallions were a bad lot, and it would be invidious to name one in particular; though it strikes us that a horse with more quality and less hair on his legs would be preferable to those at present in use in the neighbourhood.

The poultry show was excellent, as may be inferred from the fact that Mr. Fowler of Aylesbury was only commended in some classes; and there was a fair supplementary exhibition of agricultural implements. The day's proceedings were wound up by a dinner at the King's Head Hotel, under the presidency of Lord Tredegar, at which, however, we were unable to attend. There was a deal of angry discussion over the award of the stallion prize to Prince of Wales. Mr. Cartwright said that, to his knowledge, Modesty, Prince of Wales' dam, had been running as a half-bred for several years, and he objected to the prize being awarded to that horse, as appeared on the list, until it was satisfactorily proved a thoroughbred. He looked upon a half-bred stallion as the greatest nuisance that could be introduced into a country. Lord Tredegar thoroughly concurred with the remarks of Mr. Cartwright, and intimated that the prize would be withheld until Modesty should be proved to be a thorough bred. On the name of Mr. G. Miles's horse, Prince of Wales, being mentioned also for the Corporation Prize of 20 gs. for the best entire horse in the yard, the Mayor rose and said, on behalf of the corporation whom he represented, that he objected for precisely the same reason as that given by Mr. Cartwright to Prince of Wales taking the Corporation Prize. Mr. Relph, although he agreed with the decision of the Chairman in regard to the former prize, objected to their withholding the prize to the same horse in the Corporation competition. He drew attention to the fact that the prize was offered to the best entire horse, nothing being said as to thorough-bred. He therefore thought it undesirable to alter the terms of the prize after they had been published. The discussion was warmly continued for some time; but at length Lord Tredegar said he had got the three best judges he could obtain, and as they had awarded the prize to the best entire horse in the yard, in accordance with the terms of the award (no mention in this instance being made of thorough-breds), he would, with the permission of the company, hand over the prize to Mr. Miles. Mr. Miles, on receiving the cup, expressed himself strongly on the point which had been raised, and contended that Mr. Cartwright was wrong in the view he had taken. Of course the Judges are in no way implicated in this dispute, which must depend entirely upon the wording of the conditions.

Mr. Borton, of Barton, Yorkshire, has just sold two Leicester rams, to go to New Zealand, being shipped for Major Whitmore, of Rissington Napier, Hawkes Bay. They are both shearlings, No. 33 by the Royal Worcester prize ram, dam by Old Buckfoot; and No. 36 by the Royal Worcester Ram, dam by the Old Royal Lincoln ram; whilst 33 and 36 have themselves been also successful on the show ground.

THE FARMERS' CLUB DINNER.

The annual dinner of the Farmers' Club took place on the Tuesday in the Smithfield Show week at the Salisbury Hotel, under the presidency of the chairman of the year, Mr. George Smythies, when nearly one hundred sat down. The dinner was an exceedingly good one, and Mr. Ransford enlivened the proceedings by singing at intervals some excellent songs, admirably appropriate to the toasts as they severally followed.

After the usual loyal toasts, the CHAIRMAN gave "The Army, the Navy, the Militia, and Volunteers."

Mr. JAMES HOWARD responded, as Captain of the 9th Bedfordshire Volunteers, observing that he was the first volunteer to enrol himself in his native county.

The CHAIRMAN said he was quite sure the next toast on the list would be drunk with enthusiasm by the majority of those in the room, being "Success to the Farmers' Club" (cheers). He said the majority, because some of those who heard him were not members of the club, but visitors. They were congratulated from the chair that time last year on having so good a house and so good a room for their meetings, and he was quite sure that the anticipations then held out had been fully realized. Since they had had such an excellent place to meet in, the club had thriven as it never throve before. During the last twelve months they had elected one hundred new members. Not only had that large addition been made to the list of members; but the Committee had felt obliged to reject the applications of a great number of gentlemen who wished to belong to the Club—rejecting them not on account of any fault in the candidates themselves or of any legal objection to their election, but because they wished to confine membership of that Club as much as possible to persons who were interested in some way or other in the land (cheers). If they went on electing members as fast as applications were made for election, they would soon have a larger number than could be conveniently accommodated; and hence the Committee had felt it their duty to reject candidates who would otherwise have been very desirable (Hear, hear). The Club had not only prospered in the last year as regarded the increase of its members, but also in a pecuniary point of view, having been enabled to invest £200 more in solid securities (cheers). Wealth was generally considered a proof of respectability, and he hoped therefore the public would soon regard them as having attained that grand point (laughter). He did not intend to detain them with a long speech; but he thought that, whilst he was congratulating the Club upon its advancing prosperity, he ought to congratulate the country at large on its improved position as regarded other matters of deep importance connected with the history of the last twelvemonth. And the first thing which suggested itself to his mind in that respect was the great decrease which had taken place in the number of diseased cattle. This time last year those who were most conversant with that matter were labouring under a great and just dread of the future. There were, indeed, persons who thought the fears entertained unfounded; but he might appeal to all present whether those fears had not been amply justified by what had taken place during the last twelvemonth. Since last December the cattle plague had assumed such proportions as to have become really alarming; but owing, as he thought, in a great degree to the admirable measures adopted by the Government (Hear, hear), and carried out more or less strictly throughout the kingdom, the country had happily at length obtained almost entire freedom from that terrible calamity. A few weeks ago he was in hopes that he would be enabled to remark on that occasion that they were entirely rid of the disease, but he was sorry to find that that was not the case; on the contrary, he believed that a small revival of the plague had recently taken place, arising probably from the fact that many were too eager to anticipate the great results which would be realised when it was quite removed (Hear, hear). No doubt great inconvenience arose to one and all of them from the restrictions which were, as he believed necessarily, still imposed on the cattle trade; but they must bear the burden a little longer (Hear, hear), for they would probably suffer much more if in consequence of their having obtained temporary relief from the evil the stringency of the Government regulations should be relaxed too soon (Hear). He considered it, therefore, a duty to urge them to do all they could in their respective localities, to see that the Orders of the Privy Council were still carried out in the strictest manner, however inconvenient that might be to themselves and their neighbours. He was quite sure they would be amply repaid for any present inconvenience by taking that course (Hear, hear). He had intended to mention one or two other subjects, but he felt that he was detaining them too long (cries of "No, no," and "Go on"). With regard to the recent harvest, he felt that a very great many farmers near the eastern and southern coasts had to be congratulated, not only upon the amount of their crops and the manner in which they were harvested, but also upon the high prices which they were now receiving—high, he meant, in comparison with the prices which had prevailed of late years; but they must recollect that that success or those prices had been obtained at the cost of their less successful brethren. In the west and in the north the farmers had certainly sustained great losses; and while those to whom he had just referred might congratulate themselves on having high prices, he hoped they would not forget that it was at the cost of others. Having made these remarks he would now call upon them cordially to drink "Success to the Farmers' Club" (loud cheers).

The toast was drank with great enthusiasm.

Sir S. VILLIERS SURTEES said, were he rising on that occasion for the purpose of tendering to them his opinions or advice on those subjects which commonly formed matter of discourse there, his proper diffidence would at once say to him, "Not so: you came here to listen and to learn—not to speak." But the pleasing duty which devolved upon him that evening was of a totally different nature. The subject which he wished to commend to their consideration was one that required no lessons from him. Fortunately, they had had the best of teachers—their own personal experience. They all knew, and had long known, their worthy Chairman (cheers). They had had opportunities of fully noting his main characteristics—his dignity and courtesy as chairman, the singularly rapid instinct which guided him, the clearness and soundness of his always impartial judgment; and they could never forget that he combined with these qualifications a perfect acquaintance with various branches of the multifarious subjects with which the Farmers' Club was conversant. But they had looked upon him thus far only in the light of their Chairman: before they passed from the subject let them remember that they owed a large debt of gratitude to him personally. Let them now go further a-field—let them not only look at that part of the country where his family were born, but consider what they had done for the length and breadth of Great Britain and of the whole world. He need not recall to their memory that the Chairman was one of those who lived on the land of the red sandstone—that land which was pre-eminently, the land of one of the brightest jewels in the agricultural crown of Great Britain—the Herefords (Hear, hear). He believed he was right in stating that the Chairman was not the first of his family who had distinguished himself in connection with that breed of animals. It was within his own knowledge that on the previous day a brother-branch of the same family had shown what it could do for agriculture. But he believed he was right in speaking of an earlier ancestry, in speaking emphatically of the chairman's father as the man who first brought this great jewel into public notice, and thereby benefited the whole of mankind. The old French herald was right which said "Bon sang n'a jamais menté. This was true in the present case; it was true of the breed and of the family which had done so much to assist it. It could hardly be expected that he (Sir S. V. Surtees)—a member of a family cradled at the very head-quarters of the Shorthorns, nay cradled on the very banks of that beautiful stream in whose clear waters Collins' herd first slaked its thirst—it could hardly be expected, he said, that he could conceive that the Star of the Teeswater would ever pale its orb before any other luminary (laughter). At the same time candour bade him admit, as every one in Durham would do, that the Hereford was a most worthy rival of the Shorthorn (Hear). He would not go further than that (laughter). The whole world, too, would bear him out in saying that each of those breeds had its own merits, and all present would agree with him that each under its own proper circumstances was better than the other (Hear, hear). He now called upon them to drink with brimming bumpers to the health of the urbane and intelligent chairman, of the eminent agriculturist, of the polished gentleman, of their social friend the Chairman (loud cheers).

The toast having been cordially drunk with the honours, a final cheer being given for "the Herefords,"

The CHAIRMAN returned thanks. He said, however proud he might be of the cheers which had just been given, he was more proud of the last cheer, that for the Herefords, than of all the others. He felt that, however unworthy he might be, the Herefords were every way deserving of all the commendation bestowed upon them by Sir Villiers Surtees. As regarded himself, he was sure there could not be a man in that room who did not feel that Sir Villiers had said a great deal more of him than he had merited ("No, no"); but, nevertheless, as chairman he felt greatly indebted to the proposer of the toast and to those who had received it so cordially, and he hoped he might conclude from what had occurred that in their estimation he had at all events done nothing during the past year to disgrace the proud position of chairman of that Club (cheers). He should be proud under any circumstances to be chairman of so influential a body as the Farmers' Club, but he was particularly proud that it had fallen to his lot to fill that position during the first whole year that they had occupied their new premises. The last President occupied the chair during a year only part of which was spent by the Club in that building; but he, himself, had had the honour of presiding during the first whole year after a change which he believed to have been a grand turning point in the history of the society (Hear, hear). They had now premises which afforded ample accommodation for the members of the Club, and to which they were not ashamed to invite their friends, and that was certainly not the case before. He hoped that for every agricultural association, whatever it might call itself, whether the Farmers' Club, or the Smithfield Club, or the Chamber of Agriculture, or by some other designation, that place would prove a central and rallying point (cheers). It was owing not so much to the isolated position in which farmers were placed in their own localities, as to the want of some central gathering-place, that attempts to produce an impression on the country or the legislature had hitherto generally proved futile. That difficulty was now at an end; and to whatever association farmers belonged, they might now hope to succeed in any reasonable object (cheers).

Mr. C. SEWELL READ, M.P., proposed as the next toast—"The Three Great Agricultural Societies of the United Kingdom." In doing so he observed that it was particularly gratifying after the expiration of his first year of Parliamentary apprenticeship to find, by the reception they had given him, that he still enjoyed the good opinion and, he hoped, the confidence of his brother farmers (cheers). He did not suppose it was necessary to give an account of his stewardship at that time, though he might perhaps be allowed to give a brief summary of the few important agricultural subjects which came under the consideration of Parliament in the last session. First of all, of course, came the Cattle Diseases Act, to the rigorous enforcement of which might be ascribed the almost total extinction of the disease throughout the country; but he endorsed the opinion of the Chairman that they had yet to fear that the withdrawal of the restrictions on the opening of store-cattle markets was likely to keep them in a state of painful suspense much longer than if vigorous measures were still continued. The next subject, and that not a very pleasing one to him, was the malt tax. And he must confess that he had been greatly disappointed by the manner in which that question was treated by the House of Commons. For his part, he was very thankful indeed that he had not been born or bred a philosopher; because philosophy would so pervert a man's judgment as to allow him to rise in the House of Commons and say that, in consequence of the decrease in the supply of coals, and its probable cessation at no greatly distant period the British farmer and labourer must still pay the malt tax until such time as the National Debt had been extinguished. He could only say that that might be philosophy, but in his opinion it was not justice. The result was, however, that the House of Commons decided by a majority of more than 80 that there should be no diminution of that impost even with a surplus revenue. Now all this was very disheartening, and therefore he looked at the question as entirely wrapped up in this, that they must bring their minds to at least approve of a substitute in the shape of a beer duty (Hear, hear, and no, no). He did not say they were to ask for it; but if it were proposed he did not see that they could anyhow get rid of the imposition of a small beer duty (Hear, hear). Such a measure would do this—and it was essential that farmers should consider it—it would get rid of an immense quantity of adulteration, and instead of having countless tons of sugar used in the manufacture, as had been the case this year in particular, they would find that the best and cheapest material for making beer was neither more nor less than malt (cheers). No doubt people thought that a great deal of wind had been taken out of their sails lately by the high price of barley; but it was not when they had a poor crop of barley and half of it, perhaps, injured, while some had good crops, that they felt the full force of the tax. It was when they had generally large and abundant crops that they experienced the greatest pressure; and surely if the brewers could this year pay 50 per cent. more for barley and 50 per cent. more for hops, they must be driving a jolly good trade (Hear, hear). There was one other subject, with which he would dismiss Parliamentary matter: he referred to the Irish Tenant-Right Bill, which, to the surprise of a great number of members in the House, he did not support, but, on the contrary, criticised and warmly opposed. He had yet to learn that tenants' right meant landlords' wrong; and he contended that that bill was nothing less than a partial confiscation of property. And although as a tenant farmer he might have been expected to support a measure of that sort, he was sure that honesty was not only the wisest, but by all means the best policy, and that the only proper way by which farmers could obtain their rights was on all occasions to respect and uphold the rights of those who were above them (cheers). He wished them, of course, every prosperity, and that next year might be a far better one than the past; and in that spirit he asked the company to drink prosperity to these great national institutions (loud cheers).

Mr. J. THOMPSON gave the health of Mr. E. Little, the chairman-elect for the coming year, as an excellent neighbour, and one whose opinions were held in the highest respect in his own district.

Mr. LITTLE, having first acknowledged the compliment, proposed "Continued Success to the Smithfield Club." In adverting to the show of fat stock in the Agricultural Hall, he showed that the Smithfield Club also had proved itself worthy of taking rank as a national institution, for to its exertions the country was greatly indebted for the production of a very large quantity of the best food (cheers). When it was remembered that a quarter of a million of cattle had died of the plague in the course of the year, and that fifty thousand more had only escaped the disease by being killed, he thought they might congratulate themselves upon the fact that the show was one of the finest in respect of quality, if not of numbers, that had ever been held. No other body than the Smithfield Club could have brought together such a collection of stock under existing circumstances; and the result was highly creditable to the pluck of the club and to the enterprising spirit of the English farmer (cheers).

Mr. BUCKLEY, one of the judges of stock, briefly returned thanks.

The Rev. E. SMYTHIES gave, "The Local Farmers' Clubs;" and, in doing so, availed himself of the opportunity to pronounce a high eulogium on the memory of the late Mr. Charles Stokes, who for many years had sat on the committee of the club established in his own neighbourhood, and was also a member of, and a regular attendant at, the meetings of the Central Club, in London. By that gentleman's death, though at a ripe age, they had lost a true and valued friend, and one whose solid character all who knew him had learned to respect (Hear, hear). With the toast he associated the name of Mr. Simpson, vice-president of the Wakefield Club.

Mr. SIMPSON, in the course of his reply, expressed an earnest desire to see the various local clubs throughout the country bound together in a closer union. They might then, he thought, go to the Chancellor of the Exchequer and demand the total and immediate repeal of the malt-tax with a much better chance of success. On that subject he felt very strongly; and they might depend upon it that the advantage of such a repeal to the agriculturist would be very considerable, whilst the maltster had no conception of the boon it would prove to him (cheers).

Mr. Moss proposed "The Committee of Management," to whom he tendered his sincere thanks for having obtained such excellent quarters at "The Salisbury" for the Club, and concluded by urging all present to use their utmost exertions in ensuring the greatest possible success to the hotel (cheers).

Mr. Coussmaker, who responded on behalf of the Committee, observed that whilst prepared to accept any little credit that was due to them for their management, they could not have achieved such satisfactory results as they had done but for the assistance they had received from their able secretary. He had great pleasure therefore in giving the health of Mr. Corbet, with the addition of a hope that the Club might long have the advantage of that gentleman's efficient services (cheers).

Mr. Corbet, who was loudly cheered, said that he looked upon the last two years as the commencement of an entirely new era in the history of the Central Farmers' Club, and he associated that new era with the building of the house in which they were then assembled. In the few remarks, then, which he had to make in return for the compliment that had been paid him, he should confine himself to the building of that house and the prospects of the Club in its new habitation. As their secretary he was in some degree responsible for their reception and comfort when the members came up from the country, and he could honestly assure them that few could have any idea of the difficulties which had had to be encountered before they could be accommodated with suitable quarters. Even their secretary himself had out of the savings he could effect been made to invest in the undertaking (laughter and cheers). But that was a merely pecuniary consideration after all, and one which the Directors of the Hotel Company, the Committee of the Club, and he himself as their Secretary had unhesitatingly thrown aside (cheers and laughter). There were other difficulties besides that with which they had also had to contend, and an old friend of his had at an early period assured him that one of the greatest of them would be that connected with the management. Undoubtedly that had been so; but his character was sufficiently well known to justify him in saying that if he spoke a good word for a man he must deserve it (Hear, hear, and a laugh); and when he told them, as he did now, that they had a good man in their present manager, he hoped they would receive the statement in the fullest sense that it conveyed (Hear, hear). Of course, they might expect to hear some complaints. He remembered that in one of Bulwer Lytton's best Comedies there was an unfortunate old gentleman in a scene at a West End Club who, however comfortable other people might be, was always driving the waiters about to find the snuff-box, and perhaps even some of those present that night had been hunting up the snuff-box (great laughter); nevertheless, he confidently asserted that the members of the Club had never been so well housed and cared for, and that the Club itself had never enjoyed such good prospects as it did at this moment (cheers). As the question of the malt-tax had been referred to, he might be excused for observing that in his opinion the only way to effect its repeal was having a larger number of independent men in the House of Commons—men who would run as straight on the question as the Hon. Member for Norfolk had done (loud cheers). Some eighteen or twenty years ago an attempt was made to get the various local farmers' clubs to unite in supporting the abolition of the malt-tax, but these clubs were found to be of an ephemeral character, and many of them talked themselves out in the course of two or three years.

The Chairman, in proposing the health of the visitors, referred in terms of regret to the loss the Club had sustained during the year by the deaths of Mr. Charles Stokes, Mr. Fisher Hobbs, and Mr. R. Garrett; but as time passed they must accustom themselves to see their older friends drop off one after another. Others, however, were there to take their places, and he was pleased to see present on that occasion a young man who had very recently been elected member for Shropshire, and in that capacity had shown a deep interest in the welfare of the tenant farmer. He gave them, then, "the health of the visitors, coupled with the name of Mr. Jasper Moore, M.P." (cheers).

Mr. Jasper Moore, in returning thanks for the compliment, said he had been charmed with three things in coming among them that evening. First, at finding that his friend and neighbour Mr. Smythies was held in such high estimation by the members of the Club; secondly, at hearing the singularly lucid speech of his hon. friend Mr. Sewell Read, and being able to congratulate them that agriculture was represented by a man who enjoyed and deserved respect in the House of Commons; and thirdly, at finding that the agricultural community had such splendid head-quarters as the house in which they were then met. He himself was simply the representative of local tenant farmers, who had tried their best to follow the example which had been set by the county of Norfolk (cheers). As yet, however, his constituency were new at such attempts, as was apparent from their not having returned a better man than himself (laughter). Although he might differ from many of them in politics, he had made it a rule to waive all considerations of party whenever an agricultural question came before the House of Commons; and he trusted that upon all questions which concerned the agricultural interest, and whether they were Whigs or Tories, they will be always sensible enough to pull together. With regard to the necessity which existed for having head-quarters for agriculturists in London, he himself was connected with the new Central Chamber of Agriculture, and he wished himself that that institution and this Club could be amalgamated, for he believed that nothing could be more fatal to their interests than its being generally supposed that they were pulling in opposite directions (cheers). If, however, this could not be effected, he trusted they would be like the two-headed Janus, firmly fixed together, though looking in different directions; and that whilst the Farmers' Club made it its province to look rather at the science and practice of agriculture, the Chamber of Agriculture would direct its steady gaze upon the interests of agriculture in the House of Commons (cheers). He regretted that the malt-tax did not fare better in the House of Commons than it had done, in the last session. It is now (said Mr. Moore) for the Conservative party to show whether they are in earnest or not. If they are, I have no doubt that between this and next session Mr. Disraeli will be able to make arrangements for lessening the burden; but if not, then I trust you will give us Whigs, who also have a large interest in the soil, as much credit as the Conservatives for desiring to benefit you. They (the Conservatives) are on their trial; and if they repeal the malt-tax, we shall be happy to look upon them with more favourable eyes than we do at present (cheers and laughter). He wished them all success; and he hoped that in future, whatever their private convictions might be, in London and in the House of Commons they would ever be found a united body (cheers).

The company then separated.

DEATH OF MR. READ, OF ELKSTON.—It is our painful duty to record the death of Mr. J. M. Read, of Elkston, Cheltenham, in the 41st year of his age. As an intelligent agriculturist, and one who was not only in the vanguard of progression himself, but who also felt desirous of imparting to others the result of his researches, Mr. Read's memory has a special claim upon our notice. He was one of the earliest to adopt the use of Fowler's steam plough on the Cotswold Hills, and his graphically written essay on its use, which was highly commended by the R. A. S. E. shows the difficulties he surmounted. His treatise on Cotswold sheep has also commended itself to numerous readers. As a breeeder of Hereford cattle he was frequently successful in the Royal and numerous local shows, and only last week obtained the silver medal in the extra stock cow class, and a third prize in the aged cow class, at the Smithfield Club Show, with two of his own breeding, With Cotswold sheep he has as frequently been a successful competitor. In his removal we have lost, in the prime of life, a most valuable man from amongst the farmers of England—a man of sound integrity, blessed with judgment and many sterling qualities, which rendered him highly respected by those who knew him best.

THE LATE MR. R. GARRETT.—A movement has been made for some public tribute to the memory of the late Mr. R. Garrett. In accordance with a thoughtful and considerate proviso in Mr. Garrett's will, great coats were presented to 300 of his workpeople the first week in November last,

ON CROSSING BREEDS OF POULTRY.

BY A PRACTICAL FARMER.

It was my privilege to visit the late interesting show of the Smithfield Club in the Agricultural Hall, Islington. Very superior I thought it, as a whole; but what astonished me most was the perfection which has been attained by what are called the cross-breeds. In the cattle classes they were very prominent, and first and foremost we have the *shorthorn and Scotch polled* (query Aberdeenshire) exhibited by Mr. Harris, who carried off the gold medal and silver cup as the best ox exhibited; next, Mr. Scott's *shorthorn and polled*, second prize; next, Messrs. J. and W. Martin's *shorthorn and Aberdeenshire*, third prize; next, Mr. J. Napper's *Devon and Sussex*, highly commended—three prizes and a high commendation in a class of seven, a full proof of their superiority. In the preceding or young steer class there were only four entries, receiving three prizes—Mr. Stewart's *shorthorn and polled Aberdeenshire*, first prize; Mr. J. R. Farthing's *Devon and Guernsey*, second prize; Mr. R. Moir's *shorthorn and Aberdeen polled*, third prize; Mr. H. Overman's *shorthorn and Ayrshire*, Mr. J. Wortley's *shorthorn and Norfolk*, and Mr. E. Beck's *shorthorn and Alderney*—all fine specimens of their respective classes, the shorthorn being the prime progenitor. In the sheep crosses, too, we have surprising specimens of the value of judicious crossing. Mr. John Overman's pen of *Leicester and South Down shearlings* were not surpassed in the show, taking first prize and silver medal in the class; Mr. Z. W. Stilgoe's pen of *Cotswold and Oxford Downs* were very fine large animals, taking second prize; and Mr. J. White's pen of *Cotswold and Down* were exceedingly good, taking third prize; and Mr. G. Hine's *Leicester and Oxfordshire Down*, commended, were capital sheep. Here are four honours for an entry of six pens—another proof of the excellence of cross-breeds. I name these various specimens to show that excellence does not always depend upon one particular cross, but it will be observed that the cross is from animals of pure breeds on either side, and, which is the grand *desideratum* in these crossings—*i. e.*, to be correct and right—both animals must be of pure breeds of their respective tribes. It is "this very superlative character of the crosses that constitutes the highest compliment to the excellence of the pure breeds, from which alone they can be produced." Therefore it is absolutely requisite to keep up a large stock of pure-bred animals, "germinal resources," from which to obtain the only correct and good crosses—or crosses, indeed, at all, worth the breeding. The second run and other runs of crosses are invariably mongrels, or animals of very irregular type, requiring a series of years, and consummate judgment, to bring them out as an established and profitable breed. Better keep to the first and only correct cross.

Now, I want to apply these facts, proofs, and remarks to the *Cross-breeding of Poultry*. If such remarkable success has been achieved by the cross-breeding of animals —and no one disputes it—why not of birds? The breeding and sale of poultry forms no little item in British agricultural returns, being estimated to yield about £6,000,000 per annum, or about twice the value of the poultry in the kingdom. It therefore behoves poultry-breeders to consider well the best course and practice. It is supposed by some that Great Britain alone contains about 15,000,000 and Ireland about 10,000,000 of heads of poultry; and notwithstanding that extraordinary number —which we should suppose would yield for consumption sufficient returns, both of eggs and poultry—yet we import about 400,000,000 of eggs annually, besides about 1,000,000 head of poultry. Thirty years ago "barn-door fowls" were but little appreciated, and few thought it desirable to attempt their improvement. Cockerels and hens were continued in the farmyard during their lives, and no inquiry made as to their produce, nor notice taken except to complain of the short number of eggs, &c., &c. Even in the present day I could point out farmyards where change is unknown. Of course, such yards of poultry are very unprofitable. Happily, of late years, the improvement of domestic poultry has not only been attempted, but it has become an absolute mania—so much so that our poultry shows are now our most popular shows, demonstrating a wondrous advancement, and the high breeding has become so general, systematic, and correct, that birds of surpassing beauty and weight are everywhere to be met with, and not by any means confined to any specific variety, many birds realizing fabulous prices, We cannot all be amateur breeders, hoping to make or reach these fabulous prices; but we can all endeavour to make the best of our yards of poultry, with the view to produce both eggs and market-chickens. Much depends upon the locality of the breeder as to the best course to be adopted. If the farmyard is near to a good market, the breeding and rearing of poultry is the preferable course; but, in the absence of such market, it may be right to keep poultry as layers only. In the latter case, many hens, proportionately, must be kept to make up fair quantities for the best sales. It would never do to sell them, a dozen at a time, to the country shopkeeper: no; baskets of eggs must be made up, to send to the best market. It is, however, to the breeding of market-chickens that I more particularly wish to direct attention in this paper. I want to show that these chickens can as readily be produced to weigh from seven to nine, or even ten pounds each, as the much less weight at which they are now usually sold. If so, they need no longer to be sold by the "couple," but by weight. I have three farmyards. At the lower yard, we have pure Dorking hens and beautiful white Cochin-China cockerels; at the middle yard, we have pure Dorkings, very good (prize birds); at the home yard, white Cochins and Bramah Pootras, very good. Our best produce by far is from the cross-breed—*Cochin-China cockerels to pure Dorking hens*. The chickens are, from the time of their very hatching, more healthy, grow faster, are brought forward to maturity at an early age, and with less loss than in any other sort, and we have tried many. Bramah Pootrahs do well for such crossing; but I prefer the Cochin-China. I have this day dined off a chicken which looked, on the dish, more like a young turkey than a domestic fowl: I think its live weight would be about nine pounds, and without feeding, being taken promiscuously out of the yard. Of course, to carry out this mode of breeding, provision must be made to keep up the requisite stock of pure-bred poultry. In a yard nearly adjoining my home-yard, an attempt has been made to improve the stock by introducing a Cochin cockerel; but the failure is very manifest—neither the cockerel nor the poultry have any pretensions to purity of breed. I believe, for general purposes, and of easy practicability, the cross I have named above is most desirable to propagate, being particular to have a well-formed cockerel—not long, high, and leggy—and a good class of hens. Far be it from me to say that other crosses may not be equally profitable. The Bramah Pootra hens and the Cochin China hens are both very large, are good layers, good sitters, and good mothers, and, from a first-class Dorking cockerel, would produce a good stock; but my impression is that the chickens, when brought to table, would not equal the other cross in quality, nor would they be so easily and profitably reared. Game-fowl, as a cross with the Bramah and Cochins, could not fail to produce chickens of fair form and of superior quality of flesh, but would fail in weight. I am aiming to induce the production of great numbers of heavy poultry as most advantageous to society; therefore, I would not breed or cross-breed from any but large varieties on both sides. Breeders may adopt crossing for quality and plumpness, as for aristocratic tables; and such may prove profitable, but I could not recommend it. A plump bantam cockerel and Dorking hen, or *vice versâ*, might do well for this purpose; but it must be a very fastidious lady who would prefer such little joints. A cross of game-fowl and Dorkings produce splendid table fowls, but too small for the million. In crossing for layers as to quantity only, I should prefer the game or Dorking cockerel and the Spangled Hamburgh hens; and for number and size combined, the same cockerel and Polish or Spanish hens. The Bramah Pootra and Cochin China hens are capital layers; but their eggs are too small. There is one favourable peculiarity in the latter breeds: they will frequently keep on laying throughout the winter. In the present open winter, they are laying freely; so that we are never without a good supply of fresh eggs—no slight advantage.

SALES OF FAT STOCK.

HITCHIN AUCTION MART.

On Tuesday last, the day after the Great Metropolitan Christmas market, Page, Harding, and Eve held a sale of seasonable stock, which included cattle, though there was some doubt till a late day about any oxen being offered; a special licence was, however, eventually obtained from the authorities, but the delay had a prejudicial effect on the numbers sent, while the sheep, on the contrary, were excellent, and in several cases extraordinary. The entries were 110 pens of two, four, and five each, and the prices made for the short-woolled sheep at a high rate per stone, while the long-woolled white faces, which now come into competition with the very heavy imports of improved sheep from the Continent, made comparatively lower prices. The lower price of wool would also have something to do with this difference, for a heavy fleece with equal weight of mutton would not compensate, under present conditions, for the depreciation in the value of mutton which would have been caused by its growth. Mr. J. S. Leigh, of Luton Hoo, had 20 middling "Down" sheep sold at 65s. 6d. each; C. H. Lattimore, of Wheathamstead, 15 poorly-fed Hants, at 64s. 10d. each; George Inskip, of Kneesworth, 30 well-fed crosses at 64s. 5d. each; J. Wilmott, of Harpenden, 10 Hants, at 66s. 3d. each; —. Franklin, of Graveley Bury, 10 good-conditioned Hants at 72s. 3d. each; J. Ivory, Kimpton, 10 Down-Lincolns at 58s. 3d. each; J. Long, Henlow, 10 large Lincoln-Hants at 71s. 6d. each; E. Bates, Piggots Hill, 10 plain Hants at 72s. 9d. each; W. Sworder, Westmill, three lots of four each at an average of 89s., and two lots of two each respectively at 101s. and 95s. per head. These sheep were admirably fed. Mr. Hanscombe, Pirton Grange, had 20 plain Leicester-Downs sold at an average of 60s. each; Richard Marsh had the pick of the yard in 14 capital Hants, well-fed, which sold in pairs at an average of 106s. per head; W. Low, Beadlow, had 20 good Hants-Leicesters sold at from 73s. 6d. to 75s. each; James Low, Baldock, 20 Hants and Hants-Lincoln at 83s. each; C. Sorder, Willim, had 48 sheep a year old and upwards, and 20 from 10 to 11 months, the former were well-fed and made from 75s. to 93s. each, while the latter, which had been clipped as lambs, and were extraordinary for the weight of mutton they carried, as will be judged from the price they made, viz., 67s. 9d. each; Richard Oakley, Lawrence End, sent 20, which were sold in pairs at 53s. up to 82s. per head. Three prize sheep of the Lincoln breed, sent by Mr. Woodward, Aspenden, were sold singly, and made an average of 103s. each. The contrast between the price per pound of these sheep, and that given for the short-woolled breeds, was so marked that it cannot fail to leave a lasting impression on the feeders who were present.

The cattle made good prices, but not equal to those of the last three years. Six two year and three year old Shorthorns sent by C. Armstrong, Godmanchester, made £29 18s. each; four of S. Woollatts, Aston Bury, £28 5s. each; E. Crouch's good Herefords, 12 in all, made from £24 5s. to £33 10s. each; G. Horn's 6 young and fatter Herefords made an average of £26 13s., and four young Shorthorns made £30 each. A very handsome and well-fed young Shorthorn heifer, looking only two years old, sent by Mr. Bates, Eaton Green, made £33 10s., and his plain but fat cow made £35; Mr. Tossey sent a grand three-year-old Shorthorn, well-fed and well-bred, which induced the offer of a great price, viz., £47 5s.; his Shorthorn cow made £40. Richard Oakley, Lawrence End, sent a young Shorthorn ox, which made £42 10s.; J. Lavender, Brownham, sent 3 Shorthorns, which sold respectively at £41, £39 5s., and £44; Mr. Tingey, Henlow, had 2 Shorthorns, which sold at £29 5s. and £36; Mr. Bolton, Patnoe, sent an ox too highly fed to please the butchers, therefore although he was of great comparative weight he made only £50.

THE LATE PRESIDENT'S BAG.—Why do we read in accounts of battues of the amount of "the bag"? Is a bag ever used on those occasions? And if so, who carries it? We are induced to ask these questions from seeing in the report of the sport at Sir Edward Kerrison's, on the occasion of the visit of the Prince of Wales, that on Tuesday last His Royal Highness the Duke of Edinburgh "obtained a bag of about 250 head to his own gun," and that "a bag" was made by eight guns on that occasion to the following extent: Pheasants, 300; hares, 326; woodcocks, 3; rabbits, 900. Total, 1,533.—*Pall Mall Gazette.* [Is there not something "prodigious" in the very sound of 300 hares and 900 rabbits? —EDITOR M. L. E.]

PORTRAIT OF "RAINBOW" THE PRIZE HUNTER AT ISLINGTON.—In the current number of the *Sporting Review* an admirable likeness of Mr. Anstruther Thomson's celebrated hunter is given from a painting by Mr. E. Corbet, who certainly succeeds in catching the character of a horse and putting it on canvas better than any artist of the day. He has, perhaps, allowed his knowledge of the powers of this wonderful animal to lead him into thickening him all over a trifle more than is justified by the original, who does not look the weight-carrier that he is; but, with this trifling exception, the portrait is to the life. The engraving is accompanied by an article from the pen of "Castor," who, of course, cannot fill his three pages with a description of the horse; but the readers of the *Review* will not quarrel with his running off the main line on to the branch, which leads to the doings of Mr. A. Thomson and his hounds at the celebrated Redcar Show and in the Pytchley country.—*Field.*

POINTS OF A BREEDING SOW.—S. Lewis, of Boone county, Illinois, gives in the *Prairie Farmer* his ideas upon the above subject: "In the first place she should be square-built, have a short nose and short ears, short legs and back, with latter hollow or bent. Shoulders should be heavy and deep. Never let her raise pigs until she is a year old, and never but one litter the first year. Then, if she proves a good milker, let her raise two litters per year. I speak of her being a good milker. This is as essential in a breeding sow as in a good mare. Such an animal will raise better pigs, and, of course, her progeny will be better hogs for market. I find that hasty pudding and milk for the supper and breakfast, and corn for dinner, constitute a very good diet for the breeding sow. A great many farmers have fallen into an error in not allowing plenty of straw for a bed. Many build a warm pen in order to avoid giving her much straw. Let her run to a straw stack and she will build a nest to suit her self. If this is not convenient, she should have plenty of straw in the pen. Attend to these matters, and I will warrant no trouble in raising pigs in the coldest weather."

CALENDAR OF AGRICULTURE.

The ploughing of the stubbles for fallows and of leys for Lent crops must be vigorously pursued during the fresh weather of this month, in order that lands may have the benefit of pulverization from early ploughing, which no future cultivation is able to confer. During frosts and snows carry stones to roads and drains, fuel to all householders on the farm, and dung from the yards to the heaps in the fields, where it will be required for the green crops. The heaps slope down at both ends, to permit the carts to pass over and deposit the loads, which are spread evenly over the space, that is about six feet high, neatly dressed with earth laid on the edges. The heap should have a dry bed, and level.

In fresh weather cut copses and underwoods, cut and plash hedges, scour ditches and roadsides, clear watercourses, and cut drains to half the depth, to be finished in summer. Float water-meadows, and lay dry occasionally. Sow spring wheats on lands cleared from turnips, and on fallows missed in autumn.

Collect and prepare artificial manures of all kinds, and keep them under a dry, open shed.

Give the cattle in the yards fresh straw daily; and give the turnips or other roots early in the morning, that the animals may eat during daylight, and be seen when choked or swollen. Fresh turnips daily from the fields are much best; but heavy snow and wet weather prevent the access, and the store-heap is resorted to, and not over a month's supply. The yards must be littered frequently with straw, spread thinly and evenly.

The milch cows that drop calf must have succulent food, steamed roots and chaff. Suckle the calves for veal and also for weaning, as no substitute can equal the warm milk, and in abundance. A portion of the milch cows can be used for producing butter and cheese, and a portion for suckling calves. The calf-pens are best in single apartments, about four feet by eight feet, opening into the cow-sheds from the end or from behind, as the width of the shed may admit. The floors are boarded, with auger-holes, to pass the moisture.

The sheep-flocks have fresh turnips daily, in the divisions of ewes, stores, and fatting flocks, as has been arranged. The lambs of the last year, with the fattening flock, may be confined on the growing turnips, or supplied on a grass or stubble field. A two-horse cart-load daily will be sufficient for forty that are fattening, and for one hundred in store.

Feed farm-horses with cut chaff of clover and straw, with oats and beans; and give a warm meal of steamed potatoes after work, in the twilight.

Feed the swine largely, and litter very frequently. Supply roots to the store pigs, as potatoes and beets, raw. Give the feeding hogs steamed roots, mixed with meals, served regularly thrice a day. No stock pays better than swine for food and attention.

Feed poultry with light grains and steamed potatoes, mashed and mixed with meals, in a shed, under cover. Separate apartments for each kind of animal, floors of boards, and heated underneath by a pipe of warm water, that is warmed below the houses of each division.

CALENDAR OF GARDENING.

Kitchen Garden.

So uncertain is the weather at this season, that it is impossible to do more than suggest. At all events, if lettuce, radishes, and salads are wished to be got early, frames and lights must be employed, not for forcing, but simply for protection, and with linings of dung, fern, or straw laid so thick around the box and lights as to exclude a frost of 20 deg., which may last for many days. Air must be given, at intervals of fine weather, to all vegetables grown in frames, the sashes closed every night, and covered with straw mats when it freezes—the most effectual means of defence that can be used.

If the weather and ground be open, the green and white Cos lettuce and the brown Dutch, and also a sprinkling of the short-topped radish, may be sown on a warm border. The earth ought to be free, open, and rich, to promote quick growth; and straw and fern should be at hand, to throw over it on hard nights. Sow radishes twice.

A little Horn carrot-seed, a drill of round spinach, and some mustard and cress may be sown, but not well in general.

Peas and beans are sown, two to three inches deep, in rich soil by previous manurings.

Earth-up beans and peas, if any be ready, observing to select the driest weather. Transplant cabbages from the seed-beds.

If frosty, protect the frames, and cauliflowers under glasses; celery by a couple of boards laid ridgewise, or by straw on each side of the ridges. Wheel out manure, to be ready for plots, asparagus-beds, &c.

Fruit Garden.

Prune very little, unless the buds swell materially. Lay manure around the roots of gooseberries, currants, and raspberries: it very much improves the spring growth. Do the same to fruit-trees and espaliers. If snow abounds, remove the load from off all evergreens before the sun shines, which effectually prevents the scalding of the foliage.

Flower Garden.

Do nothing in the way of planting flowers; but sow seeds in pans, mark each, and place them in a frame. Much time and labour are economised, and flowers better secured, by this method of proceeding.

FOREIGN AGRICULTURAL GOSSIP.

The French Central Society of Agriculture has just held its annual public sitting, after a somewhat laborious year's work. M. Armand Béhic, Minister of Agriculture, Commerce, and Public Works, presided at the public sitting, and in a nervous and concise discourse he rendered homage to the science of agriculture in the persons of the distinguished savants who sat round him. M. Béhic observed that agricultural industry had not always occupied in France the position which its importance assigned to it; but, thanks to the impulse and encouragement given to it by the Emperor and the Emperor's Government, it might now be said that at no period and in no country had it been in greater honour or been more really popular. Referring to the great inquiry just instituted into the condition of French agriculture, M. Béhic said: "It may be believed that sound economic or agricultural principles will come out intact from this test, and that our legislation, or at least the principal bases upon which it has been built, will be relieved by a decided manifestation of opinion from most of the reproaches addressed against it. But whatever may happen, this tribute to the agricultural interest will not constitute a vain and useless demonstration. Public opinion is the soil in which ideas are sown and fructify; it gains by being moved and agitated, and it is on this condition that it acquires or reveals all its fertilizing elements."—In connection with the Paris Universal Exhibition of 1867, the Imperial Commission proposes to show in activity apparatus working ordinarily on farms or in fields, and to exhibit methods of production on conditions as nearly resembling the reality as possible, so as to disseminate in the public mind useful ideas as to agricultural practice. All these matters, however, cannot find, either in the Palace of the Exhibition or in the Champ de Mars, a theatre adapted to them, and it is proposed accordingly to accommodate them in the Ile de Billancourt. Already several distinguished agriculturists have been planning illustrations of their cultivation, so as to make known their methods and croppings, and the mechanical means which they employ to remedy a want of labour now generally felt. Some chiefs of industry have applied for permission to maintain agricultural apparatus in operation during the whole duration of the Exhibition; and sites have been granted to them for the production of alcohol, bread, butter, cheese, flax, manures, charcoal, &c. Horticulturists and arboriculturists will exhibit specimens of their culture, according to the most improved methods; and, finally, some great constructors will instal complete workshops, showing agricultural machinery in motion. These latter exhibitors propose to make daily trials to show the utility of their apparatus. Upon the whole, the Billancourt Exhibition has awakened on all sides lively sympathies in the public mind. It will respond, indeed, to two legitimate wants: it will assure the exhibitor an exceptional publicity, and it will put the agriculturist in a position to judge by himself the merit of the implements which he requires.—It is to be feared that 1866 will have proved a very unfavourable year for Italian agriculture. We have previously, we believe, indicated the three principal causes of the sufferings of Italian agriculture—first, the late Austro-Italio-Prussian war; secondly, the excessive use of paper-money; and thirdly, a bad harvest. The first difficulty has been happily adjusted by the conclusion of the treaty of Vienna; and, already, the restoration of peace has caused hopes to dawn again. The Ministry, in order to provide against the other phases of the crisis, has established a commission charged with the task of studying the wants of agriculture in the Italian peninsula, and proposing measures calculated to improve its condition. This commission, which is presided over by the Marquis de Sambuy, comprises such gentlemen as Signors Berti-Pichat, San Severino, Parlatore, Cantoni, Cappari, Ottavi, Toscanelli, &c. The commission inaugurated its operations with a speech by Signor Cordova, who insisted on the urgency of providing for certain reforms, and of taking account in Legislative arrangements of the natural division of the Italian territory into three great districts—viz., the valley of the Po, the Apennine region, and the sub-Apennine plains. The Minister indicated the disorders which prevailed in the forest *regime*, the want of vicinal roads and agricultural knowledge, and he concluded in these terms: "Public attention is fixed on us. For a long time past the country has demanded that the Government—the war of independence once terminated—should develope with solicitude the germs of the national wealth, and utilize the gifts which Nature has so generously showered upon us. The happy coincidence which has caused your sittings to open at the same time that peace is announced will not fail to fortify your hopes." To fulfil its task more easily, the Commission has been divided into seven sub-commissions, charged with the duty of specially directing their investigations to the questions of agricultural credit, rural police, agricultural instruction, the representatives of agriculture, public works in their relations with Agriculture, sericiculture, and the relations of customs and octroi duties with agriculture. In anticipation of the results of the inquiry based on a programme so vast, the press directs attention to the somewhat similar situation established by the inquiry which is being pursued in France, and discusses the reforms which it is desirable to introduce. We can only recal them very summarily, as they are numerous. Although the soil of Italy is susceptible of great improvements on condition of applying the principles of modern science, the Italians have hitherto shown very little readiness to accept and adopt the improvements introduced elsewhere into cultivation; and the mode of cropping most frequently was not varied for ages. It is, however, important to develope in the future a variety of crops adapted to the new requirements of consumption; and even where irrigation is not practicable, it may be desirable to promote the cultivation of forage and industrial plants by having recourse to the rotations. It is important, also, while increasing the fertility of the soil, to maintain it constantly without increasing the cost price of cereals. In a country which lacks coal, as Italy does, agricultural industry is almost the only branch of human effort which offers chances of remunerative labour, and all exertions must consequently tend towards it. Unfortunately, apathy and ignorance are almost insurmountable obstacles; and the fact must not be forgotten that Italy comprises in the rural districts, according to the latest statistics collected, more than 13,000,000 individuals who are unable to read or write. It is easy to foresee the deplorable results of such ignorance, which perpetuates bad systems of cultivation and practice condemned by science, which maintains the use of imperfect tools and implements, which induces cultivators to attempt to farm more land than they can manage, which keeps capital aloof, and, in a word, increases expenses, to the detriment of production.

CATTLE TRAFFIC ON RAILWAYS.—It appears that the number of cattle carried on railways in England and Wales in 1865 was 1,874,020, as compared with 2,083,254 in 1864, showing a decrease of 209,234. The number of cattle carried on railways in Scotland in 1865 was 488,762, as compared with 482,656 in 1864, showing an increase of 6,106. The number of cattle carried on railways in Ireland in 1865 was 407,048, as compared with 427,447 in 1864, showing a decease of 20,399. The whole number of cattle conveyed over the railways of the United Kingdom in 1865 was thus 2,769,830, as compared with 2,993,357 in 1864, showing a decrease last year of 223,527. This decline in the movemen of cattle was, of course, attributable to the prevalence of the rinderpest in Great Britain in the last five months of 1855. While the traffic in cattle declined last year, the movement of sheep and pigs appears to have increased. Thus the number of sheep carried by railway in England and Wales in 1865 was 7,001,654, against 6,786,127 in 1864: in Scotland, 1,819,125, against 1,241,279 in 1864; in Ireland, 515,632, against 428,275 in 1864, and in the whole United Kingdom, 9,336,411, against 8,455,681 in 1864. The number of pigs which made railway journeys in England and Wales last year was 1,448,731, against 1,426,264 in 1864; and in Scotland, 88,388, against 65,329 in 1864; and in Ireland, 887,577 against 773,155 in 1864, making a total for the whole United Kingdom of 2,424,696, against 2,224,748 in 1864. The total receipts from the conveyance of live stock on the railways of Great Britain and Ireland in 1865, were £690,321, as compared with £684,945 in 1864.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR DECEMBER.

Although only a moderate quantity of rain has fallen in any part of the country, the weather has been unfavourable for out-door farm labour. The want of frost has been much felt in some localities, and the land has continued saturated with moisture. As a consequence, very little English wheat has been thrashed out, and the markets have been scantily supplied with both red and white qualities; nevertheless, although millers have operated with extreme caution, prices have been well supported. The quantity of wheat known to be on passage from various quarters to the United Kingdom is estimated at 300,000 quarters. The whole of that supply—as much of the wheat now in stack in this country, from its damp condition, cannot be thrashed out for some time—will speedily pass into consumption; and we shall in all probability have very firm markets for fine samples until after the re-opening of the navigation in the Baltic. A considerable fall having taken place in the value of produce at New York, it is presumed that the exports of wheat and flour from America will gradually increase. France appears to have very little produce to spare for us; still we believe that the deficiency in the last crop of wheat has been much exaggerated.

Full average supplies of both English and foreign barley having been on offer, the sale for that article has been somewhat heavy, on lower terms. Malting barley, however, is still very scarce and dear. All other kinds of spring corn have rather given way in price; but the value of flour, although some large quantities have come to hand from Russia, has been well supported.

Notwithstanding that the potato-disease has committed extensive ravages, the Metropolitan markets have been heavily supplied with potatoes, for which the demand has ruled steady, at from 70s. to 130s. per ton. The imports from abroad have been on an average scale, but mostly in poor condition.

A full average business appears to have been transacted in wheat and most other kinds of grain, in the leading Continental ports, for shipment to England in the spring.

The public sales of colonial wool held in London closed tolerably well. All good and fine qualities were disposed of at full prices. Inferior kinds, however, gave way about 1d. per lb. on the average. The quantity of colonial wool now unsold is small, and the stocks in the hands of the manufacturers are very moderate. Low foreign wools have changed hands freely, at full quotations; but the business doing in English has been very restricted, on former terms. The transactions for export have been trifling in the extreme.

The demand for hops has been firm, and high rates have been realized for all fine qualities. The high quotations demanded by the factors, in the face of rather heavy imports from abroad, have compelled the brewers to operate cautiously.

There is a full average supply of cattle-food on hand for winter consumption; yet cakes have sold briskly, and the prices have had an upward tendency. For some time the stock will fare well, at a very moderate outlay for food.

The Scotch markets have been scantily supplied with wheat, in which, as a consequence, very little has been passing. Prices, however, have been well supported. The sale for barley and oats has been much less active than in the previous month, and inferior parcels have rather given way. All other produce has sold at full currencies. The shipments of grain to the South have been only moderate.

In Ireland the grain trade has been very inactive. Wheat has maintained its value without difficulty; but most other articles have met a slow inquiry. The quantity of new wheat as yet thrashed out is small.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding the heavy losses sustained by the cattle plague this year, the leading markets have been well supplied with beasts for Christmas consumption. The full average supplies brought forward, however, have had very little influence upon price, the best Scots and crosses having sold at 5s. 4d. to 5s. 6d. per 8lbs., and the whole of the stock brought forward has been disposed of. These quotations are about 6d. per 8lbs. beneath those realized on the "great day" in December, 1864.

As is generally the case at this period of the year, the numbers of sheep brought forward have been small; most breeds have therefore found buyers at full quotations, except towards the close of the month, when the best Downs and half-breds declined to 6s. 2d. per 8lbs.

Considerable inactivity has prevailed in the veal trade, and the currencies have given way 4d. to 6d. per 8lbs.

Much heaviness has prevailed in the demand for pigs, especially large hogs, owing to the immense quantities of dead meat on sale in Newgate and Leadenhall. The highest price has not exceeded 4s. 6d. per 8lbs.

The northern "season" for beasts may now be considered as closed. Most accounts from Norfolk, &c., state that large numbers are now ready for the Metropolitan market. The Scotch beasts have come to hand in very fine condition,

The imports of foreign stock into London have been as follow:—

	Head.
Beasts	6,864
Sheep	25,476
Calves	1,307
Pigs	1,011
Total	34,658
Same time in 1865	66,721
,, 1864	41,712
,, 1863	34,435
,, 1862	25,435
,, 1861	21,904
,, 1860	20,795
,, 1859	17,430

The total supplies of stock exhibited in the Metropolitan Market have been:—

	Head.
Beasts	20,750
Sheep	71,390
Calves	1,053
Pigs	1,950

COMPARISON OF SUPPLIES.

Nov.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1865	31,720	470	126,170	2,823	2,930
1864	23,780	470	78,410	1,441	2,700
1863	29,302	485	88,470	1,150	2,680
1862	25,810	536	85,621	1,354	3,082
1861	24,840	470	84,630	701	2,950
1860	24,540	510	82,340	1,577	2,445
1859	24,484	470	78,980	1,171	2,187
1858	20,523	490	74,275	1,472	2,450
1857	19,830	375	67,132	1,209	1,915
1856	23,995	475	73,200	1,525	2,880
1855	22,412	590	90,030	1,376	3,184
1854	20,219	120	88,880	1,573	2,746

The arrivals of English, Scotch, and Irish stock during the month thus compare with the three previous years:—

From—	Dec., 1866.	Dec., 1865.	Dec., 1864.	Dec., 1863.
Lincolnshire, Leicestershire, and Northamptonshire..................	7,800	10,500	8,500	10,500
Norfolk....................	—	700	1,200	2,200
Other parts of England.	2,700	4,700	3,200	3,800
Scotland	1,360	2,243	1,901	2,370
Ireland	2,020	1,150	1,070	2,350

Beef has sold at from 3s. 4d. to 5s. 6d., in some instances at 5s. 8d.; mutton, 3s. 8d. to 6s. 4d.; veal, 4s. 2d. to 5s. 10d.; pork, 3s. 6d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Dec., 1865.				Dec., 1864.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef from…………	3	2 to	5	6	3	6 to	6	0
Mutton ……………	3	8 to	6	8	3	8 to	6	2
Veal ………………	4	0 to	5	0	4	4 to	5	6
Pork ………………	4	0 to	5	4	3	6 to	5	0

	Dec., 1863.				Dec., 1862.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef from…………	3	4 to	5	2	3	4 to	5	2
Mutton ……………	4	0 to	6	0	3	6 to	5	10
Veal ………………	4	0 to	5	0	3	6 to	5	6
Pork ………………	3	6 to	4	6	3	4 to	4	8

About 40,000 tons of foreign meat have been disposed of in Newgate and Leadenhall markets, and the supplies from various parts of England and Scotland have been extensive. A good business has been passing, but at rates which have not been considered remunerative.

WEST SUSSEX.

The year is fast drawing to a close, and I fear that very many will have to look back on the year 1866 as a disastrous one. In many districts no doubt the harvest was the most tedious and difficult we have had for many years, and a long harvest and a late harvest may generally be set down as a bad harvest. In this division of the county I think we may consider ourselves most fortunate as regards weather. Embracing such a variety of soil as it does, of course there were some farms on which the crops lay in the fields until serious damage ensued, but upon the whole I think there is good reason to be thankful. The price to which wheat has reached I think fully bears out the opinion I expressed some months ago, that the wheat crop would prove very deficient, and I know many farmers, who were rather sanguine as regards the yield, that have been obliged to acknowledge their mistake. The very wet weather we had in September made the farmers in the stiff land of the Weald almost despair of getting a season to put in their wheat; but October came in very fine and dry, and I think the seed was got in under very favourable circumstances, and in this division the wheat plant is generally looking uncommonly well. The young seeds, too, are generally well set, and the pastures very green for the time of year. Many of the markets in this division of the county were opened again just for the Christmas stock, but some remain closed in consequence of the towns where they are held being connected with a port where foreign cattle might be landed. This, of course, leads to some difficulty; but as I heard a grazier remark the other day, "anything better than the cattle plague." All this has led to some irregularity in prices; but I believe, on the whole, for good Christmas stock good prices have been obtained. I trust I may congratulate my brother-farmers on the prospects of the New Year; all agricultural produce sells well, and I hope this time next year they will be able to thank Providence for having had a good crop, a good harvest, and altogether a good year. I am afraid that the free-traders do not quite see the present prices, but they have had a good turn, and it is quite time that the farmers should have their innings.—Dec. 20th.

NORTH CORNWALL.

The wheat which was sown in October and early in November is generally looking remarkably well; but some fields exhibit an appearance which causes some anxiety. It has been the practice of late years to employ the steam machine after harvest, and thrash out large quantities of corn. Some of this is put aside for seed, and, if the corn is not spread thinly on the floor and frequently turned, the vitality of the grains will be impaired, and if used for seed the crop will surely suffer. We have seen many a thin field of wheat of late years, which has been fairly attributable to the inferior seed which has been used, and the sickly blade now seen in more than one field in this neighbourhood is probably owing to the same cause. The mangold crop, where the right kind of seed was used, is well spoken of; but the swedes and turnips are not an average. Many of the early swedes grew with a double top, and not only were the bulbs diminished in size, but deteriorated in quality. The best crop of swedes we have seen this year was grown from the "Champion" variety from the Messrs. Sutton, of Reading. Should they stand the winter well, they will soon supersede the old Skirvings. Wheat is now selling freely at 24s. a Cornish bushel of 24 gallons. But even with this comparatively high price, it may be questioned if the returns from wheat on most farms will equal the average of years, the wheat crop being so deficient. Take an illustration: A farm may be expected to grow 400 bushels of wheat a-year. Now, it will require 100 bushels for seed and the supply of the labourers and the home establishment. The remainder at 20s. per bushel will amount to £300. But let there be a deficiency of only one bushel per acre, and the saleable produce will only be 250 bushels; and even supposing that the whole should be disposed of at 24s., the returns will be but £300. We fear that on most farms there will be considerably more than a bushel an acre deficient. The trade in beef and mutton is not nearly so brisk as it was in September, and wool is quite a drug, and it is supposed that there will be no improvement till after Christmas.—Dec. 21.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

DONCASTER FORTNIGHTLY MARKET.—We had a large show of sheep, fully equal to previous markets of late. There was a ready inquiry, and all changed hands at about late rates, viz., good light weights, 8½d. to 9d. per lb.

NEWARK FAT STOCK MARKET.—Only 147 Sheep were penned, and buyers being scarce, even that small number met with a slow sale at an average of 8d. per lb.

OSWESTRY FORTNIGHTLY FAIR.—The show of sheep and pigs was not so large as usual. Mutton realized 7½d. to 8½d. for prime, and fat pigs aboat 5½d. per lb.

PERTH FAIR.—Ayrshire cows sold at from £14 to £22, and country cows in-calf from £10 to £14. Home-bred year-olds were selling at from £6 to £7, and two-year-olds of the same breed realized from £11 to £15. A large lot of three-year-old Highland stots, in fair condition, sold at from £8 10s. to £10 a-head. There was a large show of Irish cattle brought forward, there being upwards of 300 of that breed offered for sale. Stirks sold at from £2 10s. to £3 5s. Six-quarters-old from £4 to £8, and two-year-olds from £8 to £10. There were very few sheep in the market, the only lot worthy of mention being a large lot of black-faced ewes, which sold at 14s. a-head. Superior draught horses sold at from £35 to £40; middling descriptions, £15 to £35; inferior £2 to £10. Cobs and ponies sold at from £12 to £25, and colts from £7 to £12.

TEWKESBURY FAIR, being the first held since the visitation of the cattle plague, attracted a large number of farmers and butchers. There was little else than fat stock, and nearly the whole brought to market was sold by public auction.

WORCESTER FAIR.—There was a very good supply of sheep and pigs, but very few horses, and those of an inferior quality. The attendance of dealers was small. Prime wethers fetched 75s. 6d., and ewes 49s. to 61s. each.; fat pigs averaged 16s. per score.

YORK GREAT HORSE FAIR.—Young horses from five to eight years old, in good condition and ready for the hunting field, realized according to quality from 100 to 300 guineas each; those which were seasoned and fast over light country from 200 to 400 guineas; and high-bred heavy weights of celebrity from 250 to 350 guineas. There was not nearly so active a trade in carriage horses. Well-bred, up-standing young horses of this class realized from 80 to 140 guineas each; and those with good action from 200 to 250 guineas a pair. Well-bred selections of match colts of good fashion, greys or bays, were not plentiful, and, where they changed hands, realized from 200 to 300 guineas a pair. Seasoned high steppers and broken in double harness realised from 100 to 120 guineas each. There was but little trade done in horses for broughams or light carriage work, whilst the trade in roadsters, dray, and agricultural horses, cobs, ponies, &c., may be said to have scarcely commenced.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The closing month of the year has fluctuated between frost, fog, and rain, the latter having predominated up to Christmas, and rendering field work next to impracticable. With our scanty crop of corn this year, and potatoes still more deficient, it has been well that thus far the winter has been open, leaving the grass and vegetables comparatively unharmed. The year now nearly ended has been remarkable for a great change in the value of cereals, and though spring corn has lately rather given way wheat has fully maintained its price, as the decline noted on the first Monday of this month really belonged to the last Monday in November, when factors would not submit to the practicable rates of the day, though forced afterwards to make the concession. We are therefore obliged to connect the former with the present month in the matter of wheat, which neither gained nor lost on the whole, but finished with an upward tendency. Other corn has rather given way, with the exception of fine malting barley. Maize also, which suddenly advanced 3s. to 4s. in November, has since given way 1s. to 2s. It would appear that, with some exceptions in Scotland, a full average amount of wheat has been sown this year, and that the young plants look very favourable, the earliest being almost too strong; so a little check would be rather serviceable. We are now on the verge of a new period of time, with the future as impervious to human foresight as ever; but as regards the wheat trade, there appears no prospect of a return to the rates current of late years. Indeed, it seems every heavy decline is soon followed by a reaction; and as nearly all the Baltic ports are now closed by ice, and our last advices show that Taganrog can no longer make shipments, we are about shut up to our own stocks till the opening of the ports in spring. It is observable, however, that France is already competing with us in Germany for spring contracts, while she has been buying on our eastern coasts, and withdrawing heavy shipments of Californian wheat from Liverpool, in consequence of a further rise in Paris and throughout the country markets. No part of Europe shows any decline in price; and though at New York accumulated supplies and the want of an export trade have lowered rates, they are still far above a profitable business, as prices below will testify. White wheat at Paris was quoted 70s. 6d. and red 67s. 4d.; while at Bordeaux, Blanquillo Spanish was worth 76s. 6d.; Baltic white, at Brussels, was 70s. per qr.; Pomeranian red, for spring, at Stralsund, 59s. 6d.; red, at Hamburg, 60s. 6d. per qr.; French red, at Antwerp, was quoted 68s.; home-grown wheat, at Waestricht in Holland, 63s.; white Zealand, at Rotterdam, 60s.; red, for spring delivery at Stettin, 55s.; good wheat at Danzig had sold at 61s.; native red at Cologne, 61s.; Ghirka wheat at Odessa, 42s.; Polish, 44s.; La Mancha wheat, at Barcelona, was worth 63s.; hard wheat, at Algiers, was quoted 58s. 6d. per qr.; spring wheat, at Montreal, 52s. 8d. per 480lbs.; low No. 3 Milwaukie wheat, at New York, 49s. 8d. per 480lbs.; amber, 71s. 6d.; prime Californian, 83s. 9d. per qr.; at Milwaukie and Chicago the best spring wheat was worth 53s. per 480lbs.

The first Monday in Mark-lane opened on a moderate arrival of home-grown wheat, but the foreign supply was heavy, being nearly 40,000 qrs. Though the fresh samples from Essex and Kent during the morning were inconsiderable, yet those left over from the previous week, when factors resisted a decline of 2s. per qr., made a fair exhibition, and it was found necessary to submit to a greater reduction, say 2s. to 3s. per qr., from the actual rates of a fortnight back. Holders of foreign, notwithstanding the abundance on shipboard, were indisposed to make the concessions required by millers, but where sales were ordered it was found requisite to yield 1s. to 2s. per qr., more especially on Russian qualities. The same concession was necessary as regards floating cargoes. The country markets, having previously yielded, did not follow that of London to the same extent, but nevertheless evinced a further decline, say on the average about 1s. to 2s. per qr., but Liverpool did not yield either on Tuesday or Friday. At Edinburgh and Glasgow wheat did not decline more than about 1s. per qr. The reduction at Dublin was 1s. per brl.; at Cork it was 6d. to 1s. per cwt.

On the second Monday there was a considerable falling off in the foreign arrivals, those of home-growth still being small. There were but small additions during the morning from Kent and Essex, and this circumstance made factors firm. Millers, however, being pretty well provided, were not anxious buyers, and the trade was slow at previous rates. The weather having again become mild and damp, seemed to bring more dulness over the foreign trade, but with the prospect of frost closing the Baltic, holders were not pressing. Floating cargoes were unaltered in value. The unfavourable weather influencing the condition of samples in many country markets, several noted a decline in damp and rough qualities. Hull and Liverpool made no change, and this was the case with several places, while some were cheerful, and dearer to the extent of 1s. to 2s. per qr., as were Bury St. Edmunds, Boston, Ipswich, and Newark, making the average rather in favour of prices. No change of value was noted either at Glasgow or Edinburgh. Dublin was 6d. per brl. dearer for native wheat, and Belfast exhibited a like improvement.

On the third Monday, the English supplies were still limited, but there was a large increase in foreign. The show of samples this morning from the near counties was very scanty, and indicative of more determination on the part of farmers not to submit to a further reduction; and this was sufficient to cause an advance of 1s. per qr. on dry white qualities; but red did not participate in the improvement, being generally cold in hand. Several ports in the Baltic being closed by frost, factors early in the morning were asking 1s. per qr. advance, which checked business; but, here and there, some fine Saxonska wheat realized the improvement. Floating cargoes were very firm, and fine qualities were the turn in seller's favour. The country advices this week were either firm in tone or rather dearer, and the greater proportion noted a rise of fully 1s. per qr., which, in a few instances, were exceeded, as at Spalding, Salisbury, and Bury St. Edmunds. Glasgow and Edinburgh made no change in the quotations for wheat. Dublin was firm for foreign wheat, and rather dearer for that of home-growth, though the flour trade was rather heavy.

Instead of the fourth Monday, which was merged in Christmas-day, the fourth Friday was held on the old Corn Exchange. This market had but a small supply of English wheat, though the foreign arrivals were heavy. Very few additional samples were seen either on the Essex or Kentish stands, and the trade was consequently firm, though very little was passing, the attendance being small. For all foreign samples, fully the previous rates were demanded, though but little business seemed doing.

The imports into London for four weeks were 20,062 qrs. English, 113,873 qrs. foreign, against 25,558 qrs. English, 40,772 qrs. foreign in 1865. The imports into the kingdom for four weeks ending Dec. 15th were 2,609,147 cwts. wheat, 586,581 cwts. flour. The general averages commenced at 57s. 6d., and closed at 60s. 3d. per qr.; those of London began at 65s., and finished at 64s. 10d. per qr. The London exports were only 20 qrs. wheat, 37 cwts. flour.

The flour trade through the entire month has been steady, with prices unaltered, notwithstanding good supplies from the country and foreign parts, Russia having made liberal contributions; but the quality has not been fine, the best coming only from France and Spain. The American arrivals, though increased, have scarcely any prime samples among them, these being relatively much dearer at New York. Town millers have kept the top price at 57s. Norfolks have been worth 45s. to 46s., French 48s. to 52s.; and, as prices have risen in Paris, liberal imports cannot be expected, without an advance here. The imports into London for four weeks were, in country sorts, 92,789 sacks; in foreign, 44,801 sacks 10,612 brls.; against 85,033 sacks English, 6,316 sacks 4,176 brls. foreign in 1865.

With only moderate supplies of malting barley all through the month, this quality has about maintained its value, though not in such active request, very prime parcels being still worth 53s. to 54s.; but medium and grinding sorts have declined 2s. to 3s. per qr., being in good supply, though light American is still worth 30s. per qr. We have no confidence in the prices of the lower qualities of this grain, as, notwithstanding the rise in maize, it is still relatively cheaper. The imports into London for four weeks were 16,437 qrs. British Barley, 49,590 qrs. foreign; against 29,887 qrs. British, 37,705 qrs. foreign in 1865.

Malt has declined 1s. to 2s. per qr. during the month, without symptoms, however, of any further reduction.

The oat trade has barely maintained the advance of last month, excepting for the primest sorts of old. New Swedish and Baltic being, many of them, inferior and out of condition, have yielded about 6d. to 1s. per qr. An extraordinary country demand has, however, still been kept up; and, as many ports in the Baltic are now closed by frost, and stocks in granary are light, it seems probable that full prices will be paid all through the winter. The imports into London for four weeks were 12,565 qrs. English, 746 qrs. Scotch, 4,388 qrs. Irish, 175,805 qrs. foreign; against 11,549 qrs. English, 7,563 qrs. Scotch, 7,360 qrs. Irish, 207,822 qrs. foreign for the same period last year.

The recent high prices of beans having encouraged farmers to send up their new produce and remaining stocks of old, and the same cause having produced liberal foreign imports, this grain has receded in value 3s. to 4s. per qr. As, however, the new that come to market, from their general softness, are below buyers' requirements, and the stocks of foreign are limited, we may see some reaction of foreign supplies fall off, as it is very probable they will. The imports into London for four weeks were 5,677 qrs. English, 13,330 qrs. foreign; against 7,547 qrs. English, 2,421 qrs. foreign in 1865.

Peas have been dull and neglected all through the month; and, with open weather, the inquiry for boilers has been exceedingly limited: all descriptions have therefore given way 2s. to 3s. per qr., the foreign arrivals having been lately very free. Whether boilers recover must depend on the character of the winter. The imports into London for four weeks were 3,777 qrs. English, 15,722 qrs. foreign; against 2,857 qrs. English, 13,427 qrs. foreign in 1865.

The linseed supply has continued very small, and prices have been fully maintained, with a very free sale for cake.

Cloverseed has been hardening in value, as it has become evident our own crop is both very short and of inferior quality. Prices, recently, in France have been steady, and well maintained; and very probably, when the season opens, we may see an advance. Canary has also gradually been improving, as well as mustard and other seeds.

IMPERIAL AVERAGES

For the week ended Dec. 15, 1866.

Wheat	71,022$\frac{1}{8}$ qrs.	60s. 3d.
Barley	72,583 ,,	45s. 7d.
Oats	8,570$\frac{3}{8}$,,	24s. 5d.

AVERAGES

For the last Six Weeks:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.
Nov. 10, 1866..................	57	2	44	9	23	5
Nov. 17, 1866..................	56	7	45	3	23	6
Nov. 24, 1866..................	57	6	45	6	23	9
Dec. 1, 1866..................	60	0	45	10	25	5
Dec. 8, 1866..................	61	7	46	2	24	3
Dec. 15, 1866..................	60	3	45	7	24	5
Aggregate Average	58	10	45	6	24	2
Averages last year	46	8	32	9	22	11

COMPARATIVE AVERAGES.

	WHEAT.			BARLEY.			OATS.		
Years.	Qrs.	s.	d.	Qrs.	s.	d.	Qrs.	s.	d.
1862...	64,302⅛ ...	46	10	95,740 ...	34	9	13,489 ...	20	7
1863...	99,402⅜ ...	41	1	91,436½ ...	32	10	11,749⅜ ...	19	3
1864...	78,074¼ ...	38	4	84,273⅜ ...	28	8	6,891¼ ...	19	10
1865...	91,844⅜ ...	46	8	81,970¼ ...	32	9	7,357 ...	22	11
1866...	71,022⅛ ...	60	3	72,583 ...	45	7	8,570⅜ ...	24	5

PRICES OF SEEDS.

BRITISH SEEDS.

Mustard, per bush., brown 15s. to 17s. white	12s. to	15s.
Canary, per qr.	58s.	68s.
Cloverseed, red	52s.	60s.
Coriander, per cwt.	18s.	20s.
Tares, winter, new, per bushel	5s. 0d.	5s. 6d.
Trefoil	25s.	28s.
Ryegrass, per qr.	22s.	24s.
Linseed, per qr., sowing 68s. to 72s., crushing	66s.	70s.
Rapeseed, per qr.	58s.	60s.
Linseed Cakes, per ton	£10 10s. to	£12 5s.
Rape Cake, per ton	£5 0s. to	£5 10s.

FOREIGN SEEDS.

Coriander, per cwt.	18s. to	20s.
Cloverseed, red 52s. to 65s., white	86s.	104s.
Trefoil	22s.	24s.
Ryegrass, per qr.	18s.	20s.
Hempseed, small 38s. per qr., Dutch	40s.	42s.
Linseed, per qr., Baltic 64s. to 68s... Bombay	69s.	70s.
Linseed Cakes, per ton	£10 10s. to	£12 5s.
Rape Cake, per ton	£5 0s. to	£5 10s.
Rapeseed, Dutch	58s.	60s.
Carraway ,,	42s.	44s.

HOP MARKETS.

BOROUGH, Friday, Dec. 21.—There is no alteration in our market, the demand continuing good for every description of Hops.

Sussex	£7 15	£8 0	£8 10
Weald of Kent	8 0	8 12	9 10
Mid and East Kent	8 10	9 10	11 8
Farnham and Country	8 10	10 0	11 0
Yearlings	5 12	6 6	7 10
Olds	2 10	3 10	4 4

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, Monday, Dec. 24.—During the past week the arrivals coastwise and by rail have been fair. The trade is steady for good quality; second-rate sorts a dull sale. The following are this day's quotations:

Yorkshire Flukes	per ton	100s. to 130s.
,, Regents		90s. to 120s.
Lincolnshire Regents		90s. to 110s.
Dunbar and East Lothian Regents		100s. to 130s.
Perth, Forfar, and Fife Regents ...		100s. to 110s.
,, Rocks...		80s. to 95s.
French whites		70s. to 80s.

Alexander Tod.

BOROUGH AND SPITALFIELDS.

LONDON, Monday, Dec. 24.—We have nothing of interest to notice in this market. The trade for all kinds of Potatoes has, owing to the near approach of Christmas, been very quiet, at late rates. The import into London, last week, consisted of 485 sacks, 147 tons from Dunkirk; 52 tons Dohuet; 14 bags, 6 bales, 5 baskets Rotterdam; 118 tons Rouen; and 6 bags Antwerp.

Yorkshire Regents	90s. to 135s.	per ton.
Flukes	100s. to 150s.	,,
Rocks	80s. to 100s.	,,
Scotch Regents	80s. to 130s.	,,

COUNTRY POTATO MARKETS.—Doncaster, (Saturday last): There was a large supply of Potatoes, for which the demand ruled steady at about the former rates; wholesale 9s. to 11s. per load of 18 stone, retail 1s. 2d. per peck.—Manchester, (Saturday last): Potatoes 8s. to 15s. per 252 lbs.—Pontefract, (Saturday last): Potatoes 1s. 1d. to 1s. 2d. per score lbs.—York, (Saturday last): Large supplies continue to be received in this market; and the demand being slow, previous prices are barely maintained: the quotations are 10s. per tub of 280 lbs., aad 9d. per peck retail.

PRICES of BUTTER, CHEESE, HAMS, &c.

BUTTER, p. cwt.—	s.	s.
Friesland	120 to	124
Jersey	94	110
Dorset	—	—
Carlow	—	—
Waterford	—	—
Cork	—	—
Limerick	—	—
Sligo	—	—
Fresh, per doz., 13s. 0d. to 17s. 0d.		

CHEESE, per cwt.—	s.	s.
Cheshire	78 to	88
Dble. Gloucester	74	78
Cheddar	80	90
American	66	74
HAMS: York	90	98
Cumberland	90	98
Irish	—	—
BACON:—		
Wiltshire	64	68
Irish, green	56	60

CORK BUTTER EXCHANGE, (Saturday last.)—The receipts this week amounted to 10,470 firkins, showing an increase of about 1,500 firkins over last week. The demand was dull during the week until to-day, when a spirited competition took place, with an advance in prices. The market closed firm, and higher prices are expected after the holidays. Since Monday, firsts rose from 115s. to 116s., seconds fell from 100s. to 99s., thirds rose from 79s. to 80s., and fourths fell from 74s. to 70s. There were over 400 firkins of mild cured butter received during the week; it quotes to-day from 85s. to 128s.

GLASGOW, (Wednesday last.)—A fair supply of cheese, mostly secondary, which met a rather better sale, at lower prices. About thirty tons passed the weigh-house scales. Dunlop, prime 64s. to 67s.; ditto, secondary 53s. to 60s.; Cheddars, prime, 67s. to 71s.; ditto, secondary, 62s. to 65s.

SALISBURY MONTHLY CHEESE MARKET.—The supply was unusually short, even for this time of the year, only between fifty and sixty tons being pitched. The demand ruled dull; but before the close of the market a large proportion had changed hands, the figures realized being about the same as those current last month.

PERTH CHEESE FAIR.—There was a small supply; but, small as it was, it proved more than equal to the demand, and a considerable proportion left the market unsold. Skimmed milk, 4d. to 4½d.; Saturday cheese, 5d. to 5½d. per lb.

CREWE CHEESE FAIR.—The pitch was not large, and the quality was not very prime. Prices were somewhat lower, and ranged from 55s. to 70s. per cwt.

ENGLISH WOOL MARKETS.

CITY, Monday, Dec. 24.—Since our last report very little English wool has found buyers, either for home use or export. Prices, however, have been well supported. The supplies now held by our manufacturers are very moderate, even for the time of year.

Current Prices of English Wool.		s.	d.		s.	d.
Fleeces—Southdown hoggets	per lb.	1	7½	to	1	8½
Half-bred ditto	,,	1	9½		1	10½
Kent fleeces	,,	1	8		1	9
Southdown ewes and wethers	,,	1	7		1	8
Leicester ditto	,,	1	7		1	9
Sorts—Clothing	,,	1	6		1	10½
Combing	,,	1	6½		2	0

LEEDS (English and Foreign) WOOL MARKETS, Friday.—The diminished supply of English and combing wool has had the effect of slightly advancing prices, and if the manufacturer can secure improved prices on pieces and yarn, it is probable that wool will be dearer. There is on the whole a quiet state of things in the clothing wool market, without any change of price.

GLASGOW WOOL MARKET, (Saturday last.)—The wool market here continues to show signs of returning briskness. Buyers, however, are very cautious in their operations, and transactions are restricted within the narrowest possible limits. After the new year, trade is expected to revive considerably.—*From F.H. McLeod's Circular.*

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano direct from the importers' stores, £12 5s. to £12 10s. per ton.
Bones, £6 Ditto Crushed, £6 10s. per ton.
Animal Charcoal (70 per cent. Phosphate) £5 per ton.
Coprolite, Cambridge, whole £2 10s., ground £3 to £3 2s. 6d. per ton.
Suffolk, whole £2 to £2 10s., ground £2 10s.
Nitrate of Soda, £12 5s. to £12 10s. per ton.
Gypsum, £1 10s. Superphosphates of Lime, £5 5s. to £6 5s. per ton.
Sulphuric Acid, concentrated 1·845 1d. per lb., brown 1·712 0¾d.
Blood Manure, £6 5s. to £7 10s. Dissolved Bones, £6 15s. per ton.
Linseed Cakes, best American brl. £11 5s. to £12, bag £10 10s. to £10 15s.
Cotton Seed Cake, £6 5s. to £7 per ton.

E. Purser, London Manure Company,
116, Fenchurch Street, E.C.

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JANUARY, 1867.

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THE MOMENTOUS QUESTION.

CRINOLINE.

LADIES SHOULD AT ONCE SEE

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Which, light, graceful, and elegant in outline, combines comfort and economy with the very latest fashion. Observe the name "THOMPSON," and the Trade Mark "A CROWN." Sold everywhere.

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MANUFACTURERS of CHAFF CUTTERS, CORN GRINDING and CRUSHING MILLS, TURNIP CUTTERS, PULPERS, CAKE BREAKERS, ETC., ETC.

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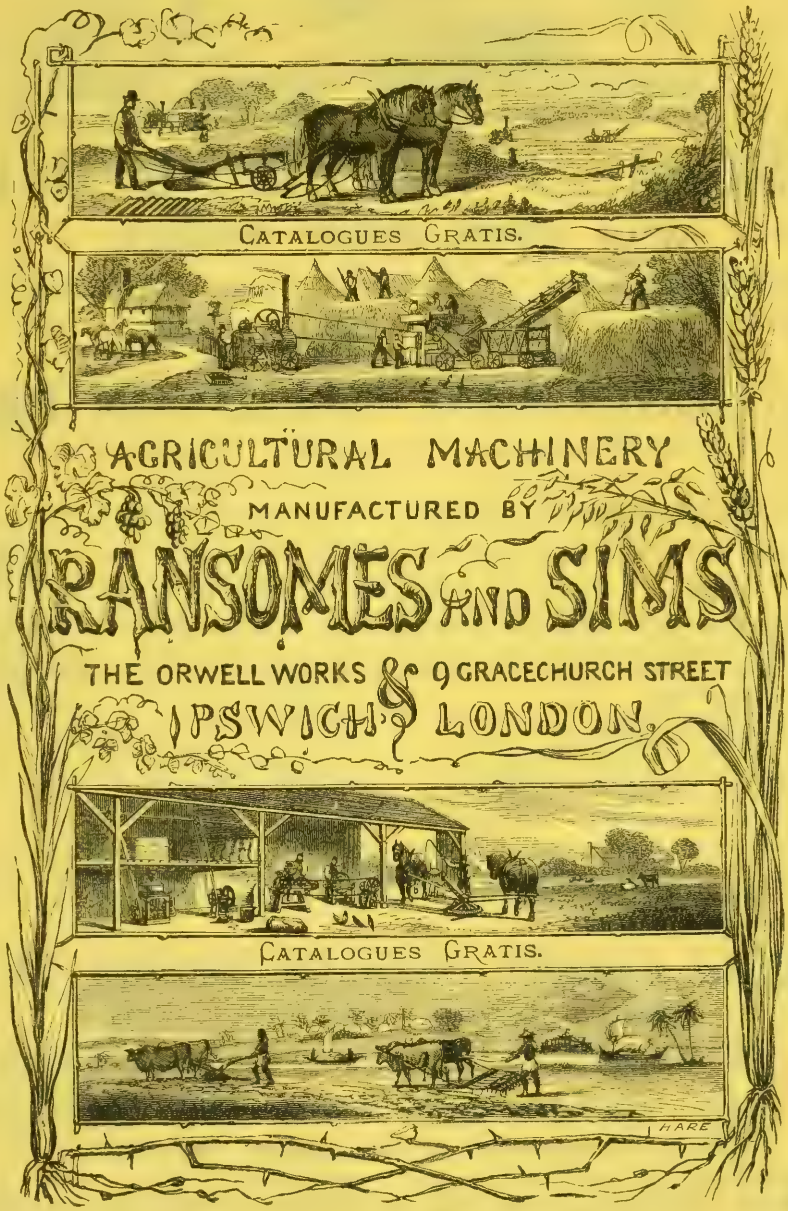

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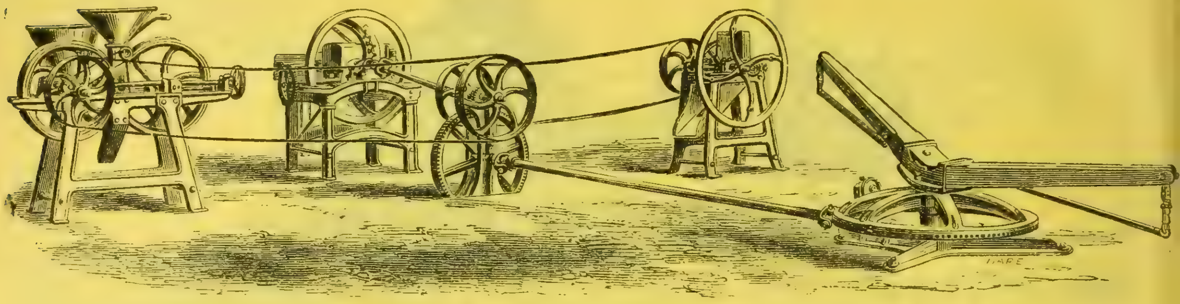

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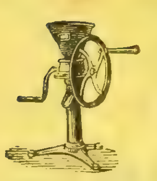

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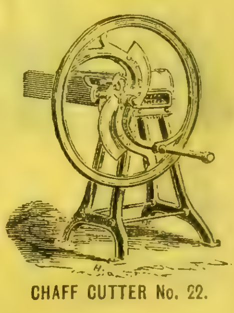

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THE FARMER'S MAGAZINE.

FEBRUARY, 1867.

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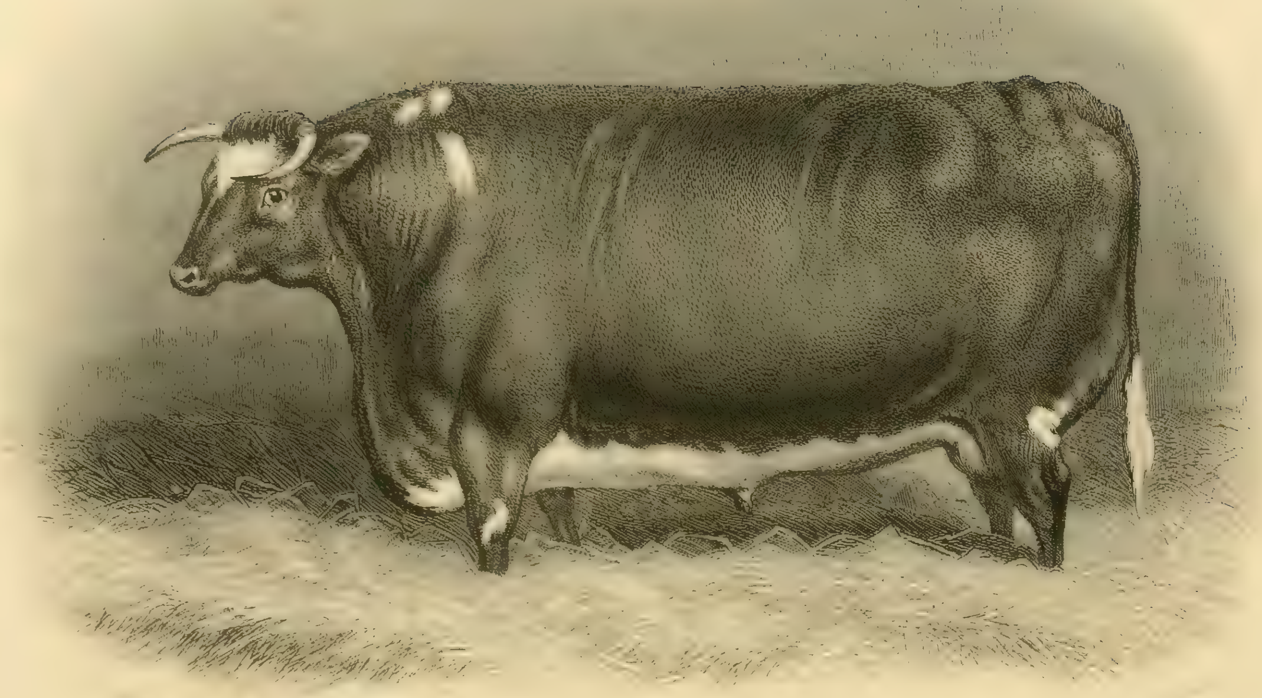


A Cross-bred Ox.

London Published by Rogerson & Tuxford 246 Strand 1860

A Clear Course

London Published by [illegible] Strand [illegible]

THE FARMER'S MAGAZINE.

FEBRUARY, 1867.

PLATE I.

A CROSS BRED OX.

THE PROPERTY OF MR. R. H. HARRIS, OF EARN HILL, FORRES, N.B.

This ox, bred by Mr. A. Cowie, of Crombly Bank, Ellon, Aberdeenshire, was by a pure Shorthorn bull from the Shethin Aberdeenshire stock, out of a small 3rd cross Shorthorn and Scotch Polled cow. Indeed, as we wrote when we saw the beast at Islington, "in appearance he takes all after the Shorthorn."

At Ythanside Farmers' Club Show, in July, 1863, the cross was first exhibited, when, as a yearling, he was placed only fourth to Mr. Moir's "Tarty." A few weeks subsequently Mr. Cowie sent him to the national Society's Show at Aberdeen, where he took the first prize, and "Tarty" the second; and Mr. Cowie sold the young one to Mr. Knowles, butcher, of Aberdeen, for £20, in the October of the same year. He was kept on by his new owner at his farm at Mondynes, Kincardineshire, until May, 1864, when, at the sale, he was knocked down to Mr. Adams, of Rama, for £48, being twenty-six months old at the time. His next appearance was at the Royal Northern Show, at Aberdeen, in the July following, where he won the first prize in his class, and was second for the Challenge Cup in competition with steers a year older than himself. He again changed hands here, being purchased by Mr. Harris, who brought him out at the Forres Fat Stock Show, in the Christmas of 1864, when he took the first prize as the best two-year-old bullock in the yard. In the summer of 1865 he won the first prize in the three-year-old cross-bred class, at the Inverness Meeting of the Highland Society; and again the first prize in his class at the Forres Fat Show, with the Highland Society's Silver Medal as the best ox or steer in the yard. At the Smithfield Club Show, in December, 1866, he took the first prize of £25 as the best cross-bred ox above three years old, and the Silver Cup of £40 as the best ox or steer in any of the classes. According to the conditions of the meeting he was sold here, to Mr. Davis, of the Cattle Market, for £70. Long before the judges came to him we had selected this ox, as, that either with the late Sir Gordon Cumming's Polled or Mr. Heath Harris' cross "the Cup must be credited to Scotland." No beast was ever better furnished throughout; but, though of fine quality, he was scarcely as good to the hand as the eye.

Some discussion having arisen as to the profits connected with this ox, Mr. Harris states that his feeding and exhibiting really paid. The following are the figures showing the debtor and creditor sides of the account, and indicating that on the beast Mr. Harris has realised a profit of £40:—

THE SMITHFIELD OX—1866.

Dr.	£	s.	Cr.	£	s.
Price of ox	57	0	Prizes at Forres, 1864 and 1865	9	10
Expenses at Inverness and London	10	0	Prize in Inverness, 1865	8	0
Keep, from Sept. 1864 to Dec. 1866 (118 weeks, at 7s. 6d.) ...	44	5	Smithfield Cup, 1866	40	0
			Smithfield Prize, 1866	25	0
			Price of ox	70	0
	£111	5		£152	10
			Deduct outlay... ...	111	5
			Profit	£41	5

Mr. Harris might have added the value of the Highland Society's silver medal, gained at Forres in 1865, and a silver cup given by Mr. Black, cattle food manufacturer, for the best animal fed on his food at the Smithfield Show; but he is willing to let these go to make up the difference between the nominal and the intrinsic value of the Smithfield Cup, though silversmiths say it is well worth the money named. As to the sum allowed for the keep—7s. 6d. per week—if anybody thinks that too little for the feeding of a show ox, he is ready to keep any number on any description of food the owner may desire at that rate, provided the beasts are not less than thirty months old to begin with.

Mr. Harris, who is Secretary of the Forres Fat Cattle Show, has had a deal of success during the last four years at the Highland Society's and other Scotch Meetings. At Forres, where they show lots of ten and six in each entry, he has been first two or three times, and for four years has invariably had the best animal in the yard; though, at the last show, there were nearly a hundred head of fat cattle exhibited. The Christmas of 1866 was the first occasion of Mr. Harris crossing the Border; while his success in the south is already something extraordinary. In addition to his Smithfield Club honours, he was first and second at Liverpool for cross-bred bullocks; one of these two animals being also the best of the show. At York, again, he took the Challenge Cup for the best cross-bred beast, and the first prize for a cross-bred the property of a tenant farmer; one of these entries being an own brother to the Smithfield ox.

Mr. Harris is also well known for his Leicester sheep, which he breeds from the best flocks in Scotland.

PLATE II.

A CLEAR COURSE.

In these days, when people go out fishing for sweepstakes, and men make books upon an All-England match, it is quite a pleasure to see a little pure sport, thoroughly free from the influence of filthy lucre. "Here, Jim, we will have the dogs with us, as we may knock up a hare on the Old Down;" and Harbinger and Heroine take, accordingly, a part in the procession. After a due inspection of the short-wools, shepherd thinks he knows where one is to be found in her form; and, as she takes a beautiful open line, it is fairly racing from end to end. The young horse jumps the rails like another Lottery; but the bitch has clearly the speed of her companion, and finishes with a brilliant kill, close on the edge of the plantations. It was a course worth seeing and riding to; but, bless us all! if it had only been for the Waterloo, the Master, with so much money on, would have scarcely dared to witness it, much less put his nag at the timber in the style he did. However, if we should drop on to another hare, we will lay you two sixpences to one that poor puss gets the worst of it!

LOW TEMPERATURES.

BY CUTHBERT W. JOHNSON, F.R.S.

When, on the last night of 1866, the thermometer fell to 24 deg., we all seemed to rejoice at the seasonable frost, with its slight fall of snow; when we had to record a further reduction to 19 deg., with a snow-fall of twelve inches, on the first night of the year of Grace 1867, we began to think more gravely of Dame Nature's bright and sparkling appearance; when, however, we found, on the night of the 3rd of January, our thermometer marked 6 deg., and on the 4th zero, we were then forcibly reminded of the probable effects of such a continued low temperature on vegetable and animal life. We say continued effect, because, with hardly a day's interval, the frost continued till the 23rd of January, the day we are now writing. The meteorologist has noted that the temperature, about the 14th of January, is often very low. Now during the month of January, 1867, the thermometer at Croydon, on the night of the 11th, fell to 19 deg.; on the night of the 12th, to 13 deg.; on that of the 13th, to 7 deg.; on the night of the 14th, to 15 deg.; on that of the 15th, to 28 deg. Some of the results of our researches upon the effects upon organic life of low temperatures will perhaps be useful to our readers.

Nature appears to aid our plants to resist the effects of frost in one or two ways. The depth to which frost penetrates, in the soils of our islands, seldom exceeding six or seven inches, the roots of plants are rarely frozen. On the nights, for instance, of the 3rd and 4th of January, when the thermometer in the air fell to 6 deg. and zero, the temperature of the soil a foot from the surface, at Croydon, was 38 deg.

Then, again, there is reason to believe that plants have the power of retaining, and even developing heat (in a way that we hardly at present understand), and so preserve their sap from being congealed. As my brother, Mr. G. W. Johnson, remarks, in his work on "The Principles of Gardening," "experiments which I have tried confirm me in acceding to the conclusion to which that distinguished anatomist, Mr. John Hunter, as well as Sprengel, Schubler, and others, have arrived—that the sap of healthy plants never congeals, however low the temperature to which they are exposed. Even in a temperature 15 deg. below that at which the sap, if taken from the tree, would freeze, yet in the living plant it remains uncongealed. This has been tried upon the vine, walnut, elm, and red pine."

These observations, regarded by themselves, would hardly establish the fact that plants have the power of developing heat, since it might be objected that the roots of trees penetrate deep enough into the ground to reach a temperature of 45 or 50 deg., and that thus a *circulation* of the sap may be maintained from the roots to the branches, and from these back to the roots. Other curious experiments, however, lead us to a different conclusion; for, as it is remarked in the interesting volume I have just quoted, it is beyond a doubt that some plants, at one period of their vegetation, generate a considerable degree of heat.

The stamens of *Arum cordifolium* emit so much heat at the time they shed their pollen, that twelve of them, placed by M. Hubert round a thermometer, raised the temperature from 79 deg. to 143 deg. Under similar circumstances, M. Sennebiar observed that the stamens of the *Arum maculatum* were nearly 16 deg. hotter than the surrounding air. The flowers of *Caladium pinnatifidum*, when emitting a strong ammoniacal smell, were observed by Dr. Schultz to be as warm as 81 deg., though the atmospheric temperature was but 61.25 deg. The stamens of the pompion, polyanthus, tuberosa, and others have also been observed to elevate the mercury at the time of shedding their pollen, but in a much slighter degree. In every instance, this evolution of heat is accompanied by a proportionate absorption of oxygen gas by the stamens and pistils, at the instant of fecundation. The stamens of the *Arum maculatum*, for instance, have been shown by M. Saussure to absorb, at that time, two hundred times their bulk of oxygen gas, converting it into carbonic acid.

If, however, a plant is frozen—and though, as we are all aware, some defy the attacks of frost, others are very liable to its fatal influence—death is brought upon them, as it is in the animal frame, by a complete breaking down of their tissues. Their vessels are ruptured, and putrefaction supervenes with unusual rapidity. As is well known, as a general rule, to those engaged in acclimatizing plants, the more abundant is the water present in their vessels, the more apt are they to be injured by frosts;

whence the young shoots are often destroyed, whilst the older branches remain uninjured; and it is noted that crops on ill-drained soils suffer more severely in winter than those whose drainage is more perfect. We have recorded a curious instance of the effects of a low temperature even upon old trees, standing in a wet soil. In the great frost of 1860-61, the old hollies and oaks at Castle Howard, in the East Riding of Yorkshire, were killed. "This hitherto-unheard-of calamity," observed Mr. G. Legard (*Gard. Chron.*, 1861, p. 553) "*occurs chiefly by the sides of a small stream which winds its way through the park.*"

As also bearing upon this fact, we may remember that in the severe winter of 1860-61, when the temperature in several places in our island was as low as from 4 to 12 deg. below zero, the gardens whose plants were by far the most injured by the frost were those from the level of the sea up to an elevation of 300 feet, those from 300 to 400 feet of altitude hardly suffering at all. Mr. R. Hutchinson, of Carlowrie, has furnished, in his prize-essay, a list of these gardens and their altitudes (*Trans. High. Soc.*, 1861—63, p. 257). From his report on that great frost, and its effect upon the Scotch plantations, we find that the plants

In the Gardens of	Ft. above Sea.	Suffered
Riccarton	300	a good deal
West Coates	250	considerably
Hanley	150	very severely
Carlowrie	92	very severely
Carged	80	severely
Cony Park	50	severely
Ginnock	40	severely

Above 300 feet of elevation, the returns were as follows:

Ochtertyre	366	very little
Taymouth	370	very slightly
Greenock	307	almost none

The beneficial effects upon vegetable life, during a severe frost, of a good covering of snow, as Mr. Hutchinson remarks, are well known. The snow in some measure maintains the soil at the temperature at which it happens to be when it falls: it may also protect the plant from the excessively drying effect of certain winds: but, under some circumstances, there are disadvantages arising from it. During the winter of 1860-61, the smaller garden-plants, wholly covered and protected with snow, were almost universally preserved; while larger and older plants, of the same species, have in many instances been killed *to the snow-line*, besides those broken down by the weight of the snow resting on their boughs. We have further observed that in some localities, generally with a southern aspect, where the snow, from exposure to the sun's rays during the day, succeeded by a frost at night, became a hard, crystalline mass upon the foliage and branches, many shrubs such as the *Aucuba Japonica* suffered severely. Instead of deriving benefit, therefore, from the covering, they were seriously injured, and sustained more damage than if there had been no snow at all.

The snow, when deeply covering our fields, there is little or no doubt, protects their crops from the dry intensely cold winds to which they would otherwise be exposed, and from exposure to the sun's rays when, perhaps, partially frozen.

Our farmers of the olden time, when they noticed these things, assigned the benefit their crops received to another cause. They fancied that it had fertilizing properties—that it contained nitre. How they arrived at this conclusion it is difficult to decide; but it is remarkable that modern chemical examinations, although they have failed to detect any traces of that salt in snow, yet it is true that small portions of nitric acid are found in it, and that acid, by combining with the potash of the soil, forms nitrate of potash, or nitre. It is also true that snow water, according to the examinations by Professor Way, of some which fell at Rothamsted, in Hertfordshire, contained, besides nitric acid, a larger proportion of ammonia than the same amount of rain-water (*Jour. Roy. Ag. Soc.*, vol. xvii., p. 620).

The examinations were made on the rain and snow of 1856. The first was made on

June 20: Heavy thunder-rain, after a week of showery weather, this being the largest rainfall in any day of the year (0.9676 of an inch). It contained—

Nitric acid ...... 0.035 grains per gallon.
Ammonia ...... 0.091 „

This is, if anything, rather below the average quantity of both substances in the rain of the year.

August 9, A.M.: Thunder-rain after very hot dry weather for eight or nine days (0.1782 of an inch in the day)—

Nitric acid .... 0.089.

September 2: Thunder rain—

Nitric acid .... 0.035.

October 22: Frost, mist, fog, &c.

Nitric acid .... 0.071.

October 28: Fog and mist—

Nitric acid .... 0.089.

October 30: Fog, mist, and little rain—

Nitric acid .... 0.088.

November 27: Snow, which fell on the 26th, melted, and collected with rain on the 27th; large total fall—

Nitric acid .... 0.053.
Ammonia .... 0.654.

The quantity of ammonia in snow is here seen to be comparatively very large, a circumstance which has been repeatedly observed, and which the experiments of M. Boussingault have confirmed.

Snow, which fell on the 2nd and 3rd of December, when melted, contained of nitric acid 0.0461 grain. On December 5, there being a little rain and mist, a gallon of the water contained of nitric acid 0.053 grain.

As it requires a fall of about 12 to 14 inches of snow to produce an inch of water, the amount of water falling in snow is commonly much less than is generally supposed, and this may serve to account for the larger proportion of ammonia found in it. For, as the Professor remarks, at least so far as rain-water is concerned, these compounds of nitrogen are evidently inversely proportionate to the quantity of water falling. In the cases of thunder-rain, the fall being slight, we have a large proportion of nitric acid, although, even then, not much greater than is found in the water of fogs and mists, where the influence of heat and electricity is not supposed. Where, however, a fair quantity of rain falls, accompanied by thunder, we find only the average proportion of nitric acid. The refreshing influence on vegetation of a thunder-shower is due to the much-needed water *as* water, and not to its being a vehicle of nitrogenous manure.

After such modern researches it is indeed curious to read the words of the poet Thomson, who, near the conclusion of his "Winter", writing a century and a half since, said—

"—— The joyous winter days,
Frosty, succeed; and through the blue serene,
For sight too fine, the eternal nitre flies;
* * * * *
What art thou Frost?——
Myriads of little salts!"

It must not then be supposed that the exposure of our cultivated plants and soils to a low temperature and to heavy snowfalls is unattended with great benefit. Although this was not the opinion of the gardeners our forefathers employed, and as I long since had occasion to remark, this was a delusion pretty sure to be caused by the reflection that almost every cultivated garden and field crop of England is a native of a warmer climate than our own. Hence, their first introducers very naturally concluded that the lower temperature of our island would be much less adapted to their growth than those in which they were indigenous: this fear, however, later and more accurate observations have shown to be in a great measure unfounded.

The research, then, into the effects produced on vegetation by exposure to different temperatures is evidently one fraught with great interest to the cultivator. Its importance did not escape the notice of Arthur Young; he long since told his contemporary farmers (*Ann. of Agr.*, vol. xxxix, p. 48), that there is no condition of life, but that circumstances may occur in the culture of the earth that will render a greater knowledge of these necessary than usually falls to the share of the generality of husbandmen. "Half the operations of agriculture," remarked Young, "are bestowed on plants exotic to the country on which they are cultivated; every day's experience gives fresh instances of the vegetables of one climate being naturalized in another." Since the days of this celebrated agriculturist, steady and important advances have been made in the scientific examination of the effects produced upon plants by the varying temperature of our climate. The general result of these observations has been to promote a much earlier practice of seed-sowing than was once deemed prudent by the English farmers. In even the early days of the present century we should hardly have expected to find for the month of January directions like those now given, to the effect that the farmer may on dry ground sow peas, vetches, barley, and oats; and moreover, that those thus early sown will in the south of England not only generally prove the best, but that the required quntity of seed is now less by one-third than that which will be needed three months hence (*Farmer's Almanack*, vol. ii, p. 5). That plants are far from being injured by considerable changes in the temperature of the atmosphere in which they are placed has been clearly shown. In very many instances these transitions appear to be very essential to their most vigorous growth. These were the kind of valuable investigations in which T. A. Knight, the first president of the Horticultural Society, delighted. He was evidently not an opponent of occasional low temperature, even for exotic plants vegetating in greenhouses and stoves; he saw that by exposure to a low temperature the plants and their seeds vegetated when the temperature was increased, with much more readiness than those which had been kept in a uniform and considerable degree of warmth. He tells us (Selection from Papers, p. 90), and his observation, it will be seen, applies to the explanation of the phenomena: "Linnæus and others have attempted to account for the ascent of the sap by the expansion of the fluids within the vessels of the plant by the agency of heat; but the sap rises under a decreasing, as well as an increasing, temperature during the evening and night (if it be not excessively cold), as well in the morning as at noon; and it is sufficiently evident that the heat applied to the branches of a vine within a stove cannot expand the fluids in the stem and roots, which grow on the outside. It is also well known that the degree of heat required to put the sap in motion in the plant is not definite, but depends on that to which the plant has been previously accustomed. Thus, a vine which has grown all the summer in the heat of a stove will not be made to vegetate in winter by the heat of that stove; but if another plant of the same variety, which has grown in the open air, be at any time introduced after it has dropped its leaves in the autumn, it will instantly vegetate. This effect appears to me," continues Knight, "to arise from the latter plants possessing a degree of irritability which has been exhausted in the former by the heat of the stove, but which it will acquire again during the winter by being drawn out and exposed for a short time to the autumnal frost. On the same principle we may point out the cause why seedling plants always thrive better in the spring than in the autumn, though the weather be apparently less favourable. In the former season, the stimulus of light and heat is gradually becoming greater than that to which the plant has been accustomed; in the latter season, it is becoming gradually less. That heat is the remote cause of the ascent of the sap cannot, I think, be doubted, and perhaps frequent variations of it are in some degree requisite (for plants have always appeared to me to thrive best with moderate variations of temperature); but the immediate cause will, I think, be found in an intrinsic power of producing motion, inherent in vegetable life." That plants of one climate adapt their habits to its temperature, and even preserve them when cultivated in a different temperature, did not escape the notice of this great vegetable physiologist; he remarks (*ibid* p. 174), "The Siberian crab introduced into the climate of England retains its habits, expands its leaves and blossoms on the first approach of spring, and vegetates strongly in the same temperature in which the native crab scarcely shows signs of life, and its fruit acquires a degree of maturity, even in the early part of an unfavourable season, which our native crab is rarely or never seen to attain. Similar causes are productive of similar effects on the habits of cultivated annual plants, but these appear to acquire most readily habits of maturity in warm climates, for it is in the power of the cultivator to commit his seeds to the earth at any season. Thus the barley grown on sandy soils in the warmest parts of England is always found by the Scotch farmer, when introduced into this country, to ripen on his cold hills earlier than his crops of the same kind do, when he uses the seeds of plants which have passed through several successive generations in his colder climate; and in my own experience, I have found that the crops of wheat on some very high and cold ground which I cultivate, ripen much earlier, when I obtain my seed-corn from a very warm district and gravelly soil, which lies a few miles distant, than when I employ the seeds of the vicinity." It is evident then, from these, and from many other observations of a similar description, that plants are sustained, and even grow, with hardly diminished vigour in a lower temperature than that to which they are generally accustomed. We have long seen this indifference of the plant to a low temperature, in the increasing practice in many districts of the much more early sowing of several of the farmer's crops than was formerly deemed advisable.

Then, as regards the action of a low temperature upon our soils: here the observations of the agriculturist and the man of science well accord. "The farmer of the heavy adhesive clay soils, which are reduced to a sufficient degree of fineness only by the most laborious exertions, is the man to whose soils the frost affords the most valuable assistance. The water contained in these clays, during its conversion into ice in a low temperature of the atmosphere, expands with a force which nothing can resist. As, therefore, the ice pervades every particle of soil, its expansion, as a natural consequence, reduces very completely the clay into a very finely divided state. The farmers of such soils, therefore, are much befriended by a hard winter, like that with which we are now visited, since the frost readily accomplishes that pulverization of the soil, which the plough and the clod-crusher can only very imperfectly and laboriously imitate. The action of frost on many varieties of such soils, it may be here remarked, is most materially aided by the land being *deeply* ploughed, and laid up in higher ridges than are commonly thought necessary. By this plan, the frost penetrates *deeper* into the earth, and thus not only is the soil more thoroughly and deeply pulverised, but the destruction of grubs and other insect vermin is rendered much more extensive and effectual. Many of these, it is well known to the entomologist, retire deeper into the soil as winter approaches, and remain torpid during the intense cold of the season, in places beyond the ordinary depth to which the frost extends. It is, therefore, very desirable that the usual effect of a very low temperature should be facilitated as much as possible. The action of frost upon even fish is well known, those in stagnant fishponds being peculiarly liable to be destroyed in severe winters. This arises from two causes—first, because, when the pond is completely encrusted with ice, a supply of the atmospheric air, so essential to the existence of fish, is intercepted; and secondly, because not only is the absorption of the air by the water prevented, but the escape of the carburetted and sulphuretted hydrogen gases, always more or less copiously generated in stagnant waters containing organic matters, is entirely stopped; and as these gases are exceedingly noxious to fish, this also conduces to their destruction. The gardener, therefore, knowing these things, is careful to have openings in the ice daily renewed, through which the gases of the pond can escape, and those of the atmosphere have access to the water.

"There is no soil, perhaps, upon which the frost operates more rapidly and completely than upon those composed of chalk. Chalk when nearly saturated, we find by our own experiments, contains about 23 or 24 parts of water; and we can hence readily see how it is that when such a large proportion of water is converted into ice, it thus by its expansion so rapidly and effectually pulverises the chalk spread over the land. It is to this levelling effect of the frost that we may, perhaps, attribute the peculiarly rounded smooth surface commonly possessed by the downs of the chalk formations. These facts explain, too, *why* it is that the farmers who have the most *successfully* practised the excellent system of *chalking*, *marling*, or *claying* light lands, have remarked that this operation never succeeds so well as when the earth is spread over the land, and allowed to remain on the surface exposed to a winter's frost. The essential condition, in fact, to the successful permanent addition to the soil of such dressings is, that the adhesive earths should be so finely divided as to be *intimately combined* with the lighter and more sandy and gravelly soil. If this object is not effected—if the marl or clay is not thus allowed to remain exposed to the action of the frost, and is ploughed in in lumps, less advantage is derived from their employment. The farmer then tells you that it does no good to the land, that it remains uncombined with the staple of the soil, and that '*it sinks down*' into the land. This, therefore, is another instance of the success of earthy dressings being sometimes entirely prevented by the mere neglect of a due attention to the *mode* and *period* of the year at which this most valuable operation is best performed; and it is to this source that many erroneous statements, and much injury to the more general adoption of one of the most certain modes of permanently improving light lands, are owing." These recollections may serve to reconcile us the more readily to the hard frosts with which we are in our favoured land ever and anon visited. We may usefully remember, as we are suffering from a biting north-east wind, that those low temperatures are far more felt by the vermin insects which haunt our soils, and that if our pumps are frozen—our water-pipes burst by the ice—still that the frost has, by solidifying the water on our heavy soils, also expanded and pulverized many a stiff clay far better than the best of clod crushers could have accomplished. And then as regards the vegetable world, we have seen that an occasional low temperature adds to their vigour; is, in fact, essential to their healthy growth. The same remark applies to the animal world, including ourselves. What would be the effect upon us islanders, who are taught to brave all weathers, if the thermometer never sank below 55 degs.? Only remember of what kind of stuff those people are made who never saw a snow-storm? What of the natives of lands where eternal spring reigns? See a whole army of these, flying before a regiment of mountaineers; and then come home, and thank God that you were placed by him in a land where there are ever and anon hard frosts and heavy snow-falls.

THE TENANT-FARMERS' BURDENS AND THE TURNPIKE QUESTION.

At the dinner of the Truro Agricultural Exchange Mr. **John Magor** said farmers were frequently taunted with being grumblers, yet there was no other class of men who would sit down and quietly allow the burdens to be cast on them which they had done. If this were attempted with any other class of men in this country, he felt satisfied that they would rise up in revolt. For instance, look at the rates which farmers had to bear. If a merchant found that his business did not answer, he could at any moment close his place of business, and the premises being returned as empty, he was exempted from the payment of rates for them; but farmers could not do this, for whether they farmed their estates or not, they must pay the rates. These rates had of late years increased enormously, and the result had been that the advantage which they had derived of late years, by the improved mode of farming which they had introduced and the extra exertions and care they had employed, was absorbed by the increased rates which they were called upon to pay. He thought that if financial boards were established, as they would be composed of men who had to look very sharply after their own money, they would be likely to look more carefully after the money of their fellow-ratepayers than the gentlemen who had now the management of the county expenditure. He did not wish to find particular fault with the county magistrates, but at the same time he considered that the establishment of financial boards would introduce greater economy in the county expenditure, and prove of great assistance to the magistrates themselves. It was said that turnpikes were to be abolished, and the repairs of the highways to be entirely thrown on the ratepayers; but if this were done, he felt assured that the whole expense would fall upon the farmers, and therefore he considered that it was the duty of the latter to set their faces firmly against the proposal.

Mr. **Oliver** said: There was one question at present agitating the public mind, and that was the turnpike-road question All were benefited by having good roads, and all should contribute towards them; but if there were any one class entitled to exemption from rates for that purpose, it was the agricultural interest. Inasmuch as trade and commerce were extending throughout the length and breadth of the land, the cost of repairing roads was much greater than formerly. He had thought much on the subject, and it appeared to be a difficult matter to say how it was to be dealt with to the satisfaction of all parties. To throw the charge of the turnpike-roads on the parishes he thought was absurd, and no Government, he imagined, would think of doing it; but the question was how to deal with it in any other form. The only plan, it appeared to him, was to turn their highways generally into large districts, the land to be taxed as at present, and that all horses not employed for agricultural purposes should have an assessed tax upon them, say of £1 per annum, which should be distributed throughout the country according to the amount of highway-rate paid by the district. By this means every class would contribute towards the maintenance of the highways, and the machinery would be very simple and inexpensive.

Mr. W. **Trethewy** said that he thought at the present time, notwithstanding the losses of the past year, farmers had not much to complain of. One of the things the Exchange should do was to petition Government to give them a Minister of Agriculture. With regard to turnpike-roads, however, the matter was settled, he hoped no other burdens would be thrown upon the land. He should be glad if some steps were taken to assist those who had suffered from the cattle plague previous to the passing of the Compensation Act.

THE CHANCELLOR OF THE EXCHEQUER AND THE MALT-TAX.

There can be no doubt but that the Malt Tax was never so ripe for Repeal as at this very moment. The country is more than usually alive to the movement, the Country Party is more than ever committed to the question, and the Farmers' Friends, so to speak, are in office. As Mr. Disraeli told the deputation, there *was* a golden opportunity in 1852; but that chance was neglected, and might "never return." It will be for the agriculturist, the Anti-Malt-tax Association, or the new Chamber to say how much or how little may be done with another such an opportunity. Can the Chancellor of the Exchequer be induced to repeat his proposal of taking off half the duty?—quite as much, we imagine, as anyone might demand or expect, although the right honourable gentleman is supposed to meet Parliament with a good surplus in hand. "The secret audience," as it has been termed at the Treasury, was then, at any rate, well timed; although, in plain truth, very little seems to have come of the interview. As for the several addresses delivered by his visitors, the sorely tried Chancellor most probably knew all the points of these quite as well as the speakers, or as do our own readers. He must have heard before now of how the action of the Malt Tax interferes with the rotation of crops, the use of inferior barley, and the feeding of stock. He is aware possibly that, as a rule, the labourer must have his beer to work upon, that the beershops lead to immorality, and that cottage-brewing is desirable. In fact, the Malt Tax has long since been past talking about, saving perhaps in the way in which Mr. Punnett put it —that the agricultural interest had "a right" to look to Mr. Disraeli for some measure in mitigation of what was felt to be a great injustice to that body. Everything after this was little more than mere matter of form; and all, of course, depended upon the reply. So far as this has reached us, it is impossible to gather any hope from the few cautious sentences uttered by the Chancellor of the Exchequer. He had much pleasure in receiving the deputation. His own sympathies were with the farmers and the labouring classes. He had always thought the Malt Duty a bad tax, and he had once proposed to reduce it; but he had met with no support from any quarter, and the opportunity might never return. Almost the only words of comfort consist in an admission that, "since then, the question had excited a very large amount of interest and anxiety throughout the country." This, in fact, is all the deputation has to go on. There is not the ghost of a promise in Mr. Disraeli's brief speech, as even Mr. Gladstone has often admitted as much, if he has bound himself down to no more.

But we will take, as indeed we have done, Mr. Disraeli's word that the cry for repeal is exciting more interest than ever; and we must naturally go to the Central Anti-Malt-tax Association for corroboration of such a feeling being manifest amongst the people. The official records of that Society, however, scarcely warrant us in assuming so much. The minutes of the last Council meeting have at length, and rather reluctantly as it would seem, been published, as we are now enabled to give these in another column. The result of the sitting is certainly not very encouraging, nor does it speak very strongly to the interest manifested throughout the country. The Secretary resigns his appointment "in consequence of the financial weakness of the Association:" a sub-committee calls special attention to this "financial position," and the general Council declares on the motion of the chairman that "the principle upon which the Central Association has hitherto relied for subscriptions has failed of success." We have, then, the old story that those who have given should give the more, though those had not given who never gave before. This was precisely the case with the former Society, when the Sussex men, with Mr. Jeremiah Smith and a few others at their head, repeated their subscriptions and donations until they fairly tired of doing all the work and finding all the money. But, in the face of such an announcement, we feel inclined to qualify our own opening remark as to the country being so alive to the movement, if Mr. Disraeli be better advised as to the interest and anxiety apparent. The true test is, as in the sad case of distress, where one man "felt very sorry" and another "felt a five-pound note." We remember the old story only the yet more keenly in the appended subscription list of the money raised in the room. We should say there was not a man who put his name down, not one amongst the Punnetts, the Ellmans, the Eleys, the Biddells, the Arkells, and others, but who has contributed, over and over again, for years past. We do not know whether it is the intention of the Council to publish from time to time any further list, but there is something very noticeable in the first issue. Of that three hundred and sixty odd pounds not a shilling is contributed by a man of title or a member of Parliament. It may be said these gentlemen had not then been invited to do so, but the sooner they are the better. Let us ascertain as quickly as possible "how much" they really do feel for the movement. In the days of the League the large manufacturers gave their thousands, and gave these again even before further aid was asked; and the landowners are, or should be, to the repeal of the Malt-tax what the millowners were to the repeal of the Corn-laws. There can be no going on without money, and the Anti-Malt-tax Association at this minute is terribly in want of money.

It is only on this showing that the more recent proceedings of the Association can be explained or understood. For the last month or two there has been a curious care evinced to avoid publicity, whereas public attention should be the very life and heart of such an institution. The more its doings are known the better; and a tradesman might as reasonably hope to thrive with his shutters up, as a Reformation Society with closed doors. We do not go so far as to say that the members of the deputation suggested the exclusion of the reporters; but, on the contrary, we believe that this step was entirely the act and deed of the Chancellor of the Exchequer himself, as it becomes only the more suspicious on that account. When Mr. Gladstone "received," he bravely faced a whole army of his old friends from "the Gallery," and spoke with the full knowledge that every word he said would go forth to the country, and be taken for what it is worth. It is difficult to see why Mr. Disraeli, the more particularly if he really means doing anything, should not have adopted a similar course. However, the deputation brought away, no doubt, all it could, and we have consulted two or three versions in framing our report of the "Reply." Still the course adopted by some of the members of the Association was, to say the least of it, eccentric. Especial pains were taken to advise the representatives of one daily journal, in which certainly the fullest account of the interview appeared on the next morning, nicely counterpoised by a leader in ridicule of the whole affair:—"We can well understand that Mr. Disraeli and his colleagues should admit the evil, and only beg 'time' to effect its removal. How can they do otherwise? As the 'Farmer's Friends,' they are *ex officio* bound to be of his opinion; yet who but an enthusiast can imagine that the malt-tax is the question of the day? Conceive the Tories going to the country with the cry of 'Derby, and beer at one farthing less per pot.'" Again, "The malt-tax is a capital theme for speeches at an agricultural dinner or a market ordinary: it is a grievance, and the British farmer dearly loves a grievance," and so on. But they must be funny tacticians who make it their great business to prime their opponents, and dutifully tell all they know, only to be laughed at in return!

THE REPEAL OF THE MALT-TAX.

On Tuesday, January 15, a comparatively small deputation, from the Central Anti-Malt-tax Association and the Midland Counties Association, had an interview by appointment with the Right Hon. B. Disraeli, the Chancellor of the Exchequer, in Downing-street.

The deputation consisted, amongst others, of Lord Curzon, M.P., Col. North, M.P., Sir E. Buller, M.P., Mr. C. S. Read, M.P., Lord George Manners, M.P., Messrs. Punnett (Kent), Brandram (Hertfordshire), Hodsoll (Kent), Fielden (Yorkshire), Baldwin (Birmingham), Murrell (Lincolnshire), Collett (Berkshire), Bartlett (Northamptonshire), Fowler (Buckinghamshire), May (Tamworth), Hanley (Lincolnshire), J. Clayden (Essex), G. Smythies (Shropshire), Clare (Warwickshire), Frewen (Leicestershire), Rev. H. Bailey (Swindon), Eley (Kent), Cobbett (late M.P.), Everett (Suffolk), Pell (Northamptonshire), Willson (Leicester), and Beardsley (Leicester).

Lord CURZON, who introduced the deputation, said that the object was to urge on the right hon. gentleman that the present was a fitting time for dealing in some manner with this question. He believed that the malt-tax repealers had a very strong case, and they had every confidence in the intentions of the right hon. gentleman to deal justly with their claims.

The CHANCELLOR of the EXCHEQUER expressed his extreme regret that, as he had to attend a Cabinet Council at three o'clock, he was under the necessity of requesting the favour of the respective speakers confining their remarks to as brief a term as possible.

Mr. PUNNETT (West Kent), as chairman of the Central Association, expressed the pleasure with which himself and colleagues waited upon the Chancellor of the Exchequer on the present occasion, the right hon. gentleman being the only statesman of the present day who had when in office made a practical attempt to abolish the duty. The members of the deputation were grateful to him for what he did on that occasion, and they believed that all that had since transpired still tended to strengthen the case for the repeal of the malt-tax. Mr. Gladstone had by repeated concessions in legislation admitted the justice of what was advanced by the repealers, and it was now wished that the right hon. gentleman (Mr. Disraeli) should take into his immediate and serious consideration whether it was not now within his power to grant at least a considerable instalment of what was demanded. It would be unnecessary to trouble one who knew the subject so intimately with arguments of a general character; but it was necessary to submit that the great agricultural interest had a right to look to the right hon. gentleman for some measure in mitigation of what was believed and felt to be a great injustice to that body. Any surplus revenue at the disposal of the Government ought in fairness to be applied to the reduction of the malt-duty, and it was also felt that such other steps ought to be taken as might be found to be within the power of the Government. He would only add that the repeal of the malt-duty had, by common consent, now acquired precedence for adjustment of all fiscal questions whatever. The income-tax was the only question that could possibly be brought into competition with it, but that was one which admitted of great variety of opinion; but there could be no reasonable difference of opinion as to the propriety of freeing, at this time of day, the great agricultural interest from an intolerable grievance.

Mr. J. K. FOWLER (Aylesbury) stated that he was there as a constituent and warm supporter of the right hon. gentleman, as well as a member of the Central Anti-Malt-tax Association. He complained that he, as a farmer, found the tax seriously to interfere with the due and natural rotation of crops by restricting the use of the inferior qualities of barley that were well qualified for the production of good beer, which in consequence of the weight of taxation could find no market with the brewers in comparison with the higher qualities of barley, and upon which only the same amount of taxation was levied. He also urged the consideration of the serious question of rearing stock which was involved in the malt-tax. Young stock was growing more valuable, and it was well known amongst breeders that no better article of diet could be given than malt, but its use was practically denied by the existence of the present duty. Another reason which brought the deputation there was that the consumption of beer by the labouring poor was greatly restricted by the duty. In his own case he paid in beer between £50 and £60 a year to his labourers, and of that amount some £20 or £25 went for duty. Upon one of his farms there was a heavy clay soil, which he was unable to turn to the best advantage because he found it unprofitable to grow certain descriptions of barley which but for the tax now levied would be most valuable for conversion into beer.

Mr. MAY said he came from the Midland Counties Association. He paid from £80 to £100 a year in beer to his farm labourers, who would be glad to consume the beer produced on his own farm if he were free of the Excise; but he was compelled to grow wheat, which was more unprofitable under the present state of things than barley would be if there were no duty, and barley would greatly improve the character of the soil. He claimed the same freedom for agricultural industry as had been conceded to all other British industries; and he could not understand that they, as growers of barley, were to be the only class of the community to be exempted from the operation of the whole course of the legislation of this country for many years past.

Mr. FIELDEN (Yorkshire) said he did not appear as a farmer, having no interest whatever in land, but as a manufacturer, employing a very large amount of labour, in Yorkshire. By statistics he showed the extent of the pressure of the tax upon the working men, and further contended that if the tax were removed the labourer could buy malt for the purposes of cottage brewing for 4s. a bushel instead of 8s., as at present paid. All who were acquainted with the subject knew well that cottage brewing was conducive to habits of morality and virtue amongst the poor, and a vast improvement upon resorting to beershops. If the malt-tax were repealed, he was confident that there would be a large amount of cottage brewing, and the labourer would have an inducement to remain at home with his wife and family, instead of squandering his means in the beershop in adulterated articles.

The Rev. H. BAILEY (Swindon) was most anxious to point out what he had found to be the injurious effects of the duty in a moral point of view amongst the working people of Swindon, where he resided. The beershops were productive of a large amount of drunkenness and depravity. The labourers and their families would not get drunk over their can of beer on their own table, and he firmly believed that home brewing would be largely resorted to if the malt tax were repealed. The remedy for much of the drunkenness that now existed was the free and untaxed access by the working classes to pure and wholesome beer, which was essential to their strength and invigourment. He would trust the working man at his own home, and lamented that injurious deleterious liquor only could at present be obtained by many of them at beershops, where so much of the crime of the country was engendered.

Mr. PELL (Northampton) said that he found amongst the labourers he employed beer was really a necessary of life, and essential to the restoration of their strength when it had become exhausted in the fields, or by other work. He had often been asked by his men to be supplied with beer, but was never asked by them for a glass of gin or a cup of tea. He hoped that, as there had been very beneficial changes in the legislation of the country with regard to the means of the great necessaries of life, justice would not be allowed to stop at malt. The hop duty had been converted into a duty on beer, without any loss to the revenue, and some were of opinion that the same might be done with malt. That, however, was a subject with which the deputation would not interfere, leaving it to the discretion and wisdom of the members of her Majesty's Government to devise the best means of removing what he and his friends considered to be a great injustice and wrong which had too long been allowed to remain upon the principal branch of the industry of this country.

The Chancellor of the Exchequer said he need scarcely assure the gentlemen present of the pleasure and willingness with which he had received the deputation. The case had been ably and fairly put before him—he might indeed say in quite an artistic manner. His sympathies they all knew were deeply with the cultivators of the soil, and the labouring classes of the country generally. He had never concealed his opinion that the malt duty was a bad tax, and he had shown that by the proposal which he made, when Chancellor of the Exchequer in 1852, to reduce the amount of the tax by one-half. But he must remind them that when that proposal was made it was not received with any enthusiastic support from the agriculturists themselves. The opponents of that measure told him that his proposal was not sufficient in itself to be appreciated by those who might have been expected to feel the greatest amount of interest in the question, and he was also told that the repeal of one-half of the amount of the malt tax would not meet the exigencies of the case. But he would tell them now, that if they had then assisted him, and the reduction of one-half of the duty had been effected, no portion of the tax would now have remained. That was a golden opportunity. Unhappily, both with respect to nations and individuals, golden opportunities neglected might never return. The Government of that day did not receive support where they might have expected it; but since then the malt duty had become a question which, no doubt, excited a very large amount of interest and anxiety throughout the country. He assured the gentlemen before him that all that had been said so well that day would have the best attention of her Majesty's Government, and would be fully remembered and considered.

Lord Curzon having thanked the right hon. gentleman for their courteous reception, the deputation then retired.

THE CENTRAL ANTI-MALT-TAX ASSOCIATION.

The following minutes of the Meeting of the Council, at the Salisbury Hotel, in the Smithfield Show week, have been published.

Mr. P. S. Punnett in the Chair, and upwards of forty members present. The minutes of the last meeting were read, and confirmed.

A conversation took place with reference to the proposed Lectures by Mr. Dawson, but no resolution was come to.

Mr. Kintrea having resigned the secretaryship of the Association, in consequence of its financial weakness, and his ability and efficiency having been spoken to in complimentary terms by various members present, it was resolved that the arrangement now existing with Mr. Kintrea shall terminate, and that in future his attention shall be directed to the agitation of the Anti-Malt-tax question as the Parliamentary Agent of the Association only; and that a gentleman be immediately engaged upon the best terms that the Sub-Committee can make, to act as secretary and clerk; Mr. Kintrea's fee for acting as parliamentary agent to be 100 guineas per annum.

The minutes of the sub-committee, referring to the financial position of the Association, were read, and a general discussion having ensued, it was unanimously resolved, on the motion of the Chairman, seconded by Mr. Hodsell: "That inasmuch as the principle upon which the Central Association has hitherto relied for subscriptions having failed of success, the Association be in future conducted upon the principle of direct subscriptions from its members, of not less than one guinea per annum, supplemented by contributions to be invited from the local Associations in their collective capacity, each local Association so contributing to have the privilege of electing one member of the Council of the Central Association for every £25 so subscribed; the Council to consist of twenty other members to be elected by the general body of the members, and the elections to take place in future in the month of December in each year."

The following Document was then subscribed: "We whose names are hereunto subscribed agree to become Members of the Central Anti-Malt-tax Association, and to subscribe towards the Fund for 1867 the amount set opposite our respective names."

	£	s.	d.
John Hodgson (for self)	21	0	0
P. S. Punnett (ditto)	10	10	0
G. P. Bacon (ditto)	20	0	0
R. H. Ellman (for Central Sussex Association)	33	6	8
J. H. Hodsoll (for Maidstone Farmers' Club)	10	10	0
Ditto (for self)	1	1	0
Marshall Heanley (for South Lincolnshire)	10	0	0
J. A. Nockolds (for Herts Anti-Malt-tax Association)	10	0	0
Ditto (for self)	2	2	0
J. K. Fowler (subscription and guarantee)	5	5	0
J. R. Cobb (for Bucks and Oxon)	£ 5	5	0
Geo. Collett (for Hungerford Farmers' Club)	10	10	0
Banbury Club	10	10	0
W. Hadland (for self)	1	1	0
W. Eagles (ditto)	1	1	0
Geo. Eley (ditto)	1	1	0
Previous guarantee (from East Kent)	10	0	0
J. B. Brandram (for self)	1	1	0
Previous guarantee (from his districts)	10	0	0
M. Biddell (from Suffolk)	25	0	0
J. S. Gardiner, Sudbury (from Suffolk)	10	0	0
Ditto (for self)	1	1	0
Edw. Gardiner (ditto)	2	2	0
John Smythe (for self)	1	1	0
Edw. Smyth (ditto)	1	1	0
Thos. Arkell (North Wilts)	10	0	0
John Plumbe (on part of Cirencester, Gloucester)	15	0	0
T. Brown (for self)	1	1	0
Donation from Midland Counties Association	100	0	0
T. Willson			
W. H. Clare			
Geo. H. May			
R. H. Masfen			
R. H. Chapman			
J. Birditt			
James Pertwee (for self)	1	1	0
Newbury and North Hants (per H. Frampton)	10	0	0
W. Biddell (for self)	1	1	0
W. Cother (ditto)	1	1	0
E. T. Simpson (ditto)	1	1	0
W. Biddell (for self and district)	10	0	0
T. Garratt, Hunsdon Mill (for self)	1	1	0
W. Wyman, Westmill Farm (ditto)	1	1	0
	£366	15	8

Dated this 11th day of December, 1866.

It was resolved that the Sub-Committee of the Messrs. Punnett, Bacon, Brandram, Eley, Fowler, and Nockolds be and are hereby empowered to conduct the affairs of the association until they shall see occasion for calling a general meeting of the members; and they were also requested to issue a printed circular soliciting subscriptions.

Mr. Willson intimated that the Midland Counties Association had requested Lord Curzon, M.P. to procure an interview with the Chancellor of the Exchequer for that Association, and that the attendance of the Central Association was wished on the occasion. It was resolved, however, that the deputation should be from the Central Association, as representing all the Associations, including the Midland, and Mr. Willson undertook to acquaint the Sub-Committee with the day and hour fixed, that a general deputation might be arranged by them.

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The half-yearly general meeting of the members was held in Edinburgh on Wednesday, January 16, his Grace the Duke of Buccleuch and Queensberry, K.G., President of the Society, in the chair.

Council on Education.—By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to prescribe a curriculum for agricultural education, and to grant diplomas.

Board of Examiners: Science and Practice of Agriculture—Mechanics and Construction—Professor Wilson; George Hope, Fentonbarns; Robert Russell, Pilmuir; and John Wilson, Edington Mains. Botany—Professor Balfour. Chemistry—Professor Anderson. Natural History—Professor Allman. Veterinary Surgery—Professor Hallen. Field Engineering and Surveying—Professor Macquorn Rankine; David Stevenson, C.E. Book-keeping and Accounts—Kenneth Mackenzie, C.A., and Archibald Paterson Meadowfield.

The Secretary read the following resolutions of a meeting of the directors of the Highland and Agricultural Society of Scotland, 3rd September, 1866—His Grace the Duke of Buccleuch and Queensbury, K.G., President of the Society, in the chair:

1. That the directors desire unanimously to express the deep and sincere regret with which they have received the information of the death of their late secretary, Mr. John Hall Maxwell, C.B.

2. That the Society having, in the minutes of the general meeting held on the 17th January, 1866, recorded, upon Mr. Maxwell's resignation of the office of secretary, their sense of the remarkable zeal, energy, and ability with which Mr. Maxwell had for twenty years discharged the duties of his office, it only remains for the directors to deplore the loss which they and the Society have now suffered by the death of one whose presence at their meetings, both as an extraordinary director and as a member of the Society, would have doubtless proved of great service if his life had been prolonged.

3. That the directors request the chairman to transmit a copy of these resolutions to Mrs. Hall Maxwell, with their respectful condolence and sympathy upon the occasion of the painful bereavement which Mrs. Maxwell and her family have sustained.

The Duke of Buccleuch directed the attention of the members of the Society to an equestrian portrait of the late Mr. Hall Maxwell, which had been painted by Mr. Gourlay Steell, at a cost of £250.

Thirty-five new members were elected.

Mr. Walker, of Bowland, said that the directors wished to propose an addition to by-law No. 2, referring to the life-composition payable by tenant-farmers, to make the by-law the same in substance as by-law No. 1, referring to the life-composition payable by other members. By-law No. 2 at present stood as follows: "Annual Subscription of 10s., and Life-composition: That tenant-farmers, secretaries and treasurers of local agricultural associations, factors, and proprietors farming the whole of their own lands, whose assessment in the valuation-roll does not exceed £500, shall pay at admission, and afterwards annually, in advance, the sum of ten shillings, with the option and power of redeeming the same by payment of five guineas as the purchase of a life-subscription." The directors propose to add the following; "And which life-subscription may be so purchased under deduction of any annual payment that the member may have previously made, with this limitation, that at no time shall a member have the power of redeeming the annual payments for a less sum than £3, or six years' annual contributions." The meeting unanimously approved of the alteration. In terms of the charter, the motion must be brought before the general meeting in June before it passes into law.

The Secretary said that it was the intention of the Marquis of Tweeddale to be here to-day, to present the report of the Committee on Steam Ploughing, appointed in February last. But he had been unable to attend, and neither was Mr. Gibson, of Woolmet, present. In their absence he would simply read the report of the committee's proceedings so far as they had gone. The report was as follows:

"On the 19th March, 1866, the committee made their first inspection, visiting the farms of Messrs. Sadler, Ferrygate; Tod, Castlemains; Begbie, Queenston Bank; Hope, Fentonbarns; and Reid, Drem, with the view of examining the work which had been done on these farms after the reaping of the previous year's crop. They found that Messrs. Sadler, Tod, and Begbie had worked Fowler's machines; Mr. Hope, Howard's; and Mr. Reid, Coleman's. The inspection occupied two days; about forty fields, extending to nearly 900 acres, were each carefully gone over, and the depths at which each field had been ploughed, smashed, or cultivated, were taken. These measurements were made from the level of the pulverized surface to the solid at the bottom of the furrow; above 150 measurements were taken, and, where necessary, were checked by dipping with the spade; 295 acres had been steam-ploughed to an average depth of 10½ inches; 470 acres had been grubbed or cultivated to an average depth of 9¾ inches; and 118 acres had been dug or smashed to an average depth of 11½ inches. On the 4th May, the committee visited Markle Farm, possessed by Mr. Henderson, and saw Mr. Fowler's latest improved machine, worked by two engines, which had arrived shortly before from the manufactory. It was harrowing land which had been ploughed in autumn with the common plough, 8 inches deep. Although the soil was clay, and the surface of the furrow very hard, the harrow penetrated and pulverized it well to the depth of 3½ to 4 inches, covering a breadth of 14 feet; it was afterwards set to grub or cultivate in the same field to the depth of 10½ and 12 inches, and did the work well. The committee were shown other two fields, where it had done the work most satisfactorily, and with no breakages. With the object of arranging to have a comparative test of the produce from land worked by the common plough and that which had been steam-cultivated, the committee visited the farm of Messrs. Sadler, Tod, Begbie, and Hope on the 4th September. All these were much pleased with the appearance of their crops after steam-cultivation, but Mr. Sadler alone could favour the committee with a comparative trial of the produce from land cultivated with the common plough and that by steam, and being able to do this with a crop of wheat after potatoes, on a field of equal soil, he kindly consented to stack equal portions, and acquaint the committee of the result. This they had not yet received. None of the other parties had crops to which such a comparative test could be applied. The committee, not having as yet had an opportunity of inspecting the different machines at autumn work, are now arranging for this to take place on an early day.

"(Signed) "John Gibson."

The Secretary added that since the dates referred to in this report two inspections had taken place—one, on the 19th November, at Dirleton, where several farms had been visited; and another at Yester, on the 4th December, to examine Lord Tweeddale's horse-ploughing.

The report was approved.

Mr. Kinloch, jun., of Gilmerton, reported that certain preliminary arrangements had been entered into for the two next general shows of the Society at Glasgow and Aberdeen. He also mentioned that the right hon. R. C. Nisbet Hamilton, Sir James Fergusson, M.P., and Mr. M'Lagan, M.P., had agreed to co-operate with the committee of the Royal Agricultural Society of England to allot the space reserved for agricultural implements at the Paris Exhibition. The Scotch exhibitors would find themselves classed with the English and Irish, as all belonging to the United Kingdom.

Mr. Kinloch moved that the Society enter on its minutes a record of their keen sense of the loss they had sustained in the removal of the late Earl of Rosslyn, and their sense of the valuable services he had rendered to the Society. And this was carried by acclamation.

Sir Walter Elliot, of Wolfelee, said he had to bring before them the subject of the better endowment of the Chair of Agriculture in the University of Edinburgh. Much had been done recently by the Commissioners for the Improvement of the Universities in Scotland, and the changes they had proposed had all been agreed to, but the Chair of Agriculture had been omitted. He observed that, amongst other endowments, they had one in the University of Edinburgh for a Chair for the study of Sanscrit Literature, which had been mainly endowed by the liberality of a private gentleman. He could not help feeling that a Chair of Agriculture ought to have found more supporters than that of Sanscrit. At present, however, the Senatus Academicus had brought the subject again before the Government, with the view of securing a better endowment for the Chair of Agriculture. That Chair had been founded in 1790, and was supported by an endowment of £50 a-year from a private individual: but, with some other minor emoluments, the whole sum for the remuneration of the Professor was not £100 a-year, really much less than that of any other Chair in the University. Besides that, the governing body of the University had no control over the class; yet, under Professor Wilson's able management and conduct, the class had been most successful, and a number of excellent students had been turned out by the perseverance of Professor Wilson. This society formerly made an offer to the Government of a certain sum for the Chair, on condition of an equal sum being voted by Parliament; but the offer had been declined. The Senatus Academicus have memorialized Government upon this matter, and the subject was now before the Treasury. As the matter was pressing, the directors had taken it upon themselves, at their last meeting, to address the Treasury also on behalf of this chair. He begged now to move the following resolution upon the subject: "That the Highland and Agricultural Society learns with pleasure that an effort is being made by the University of Edinburgh to obtain an efficient endowment for the Professor of Agriculture by an application to the Lords of the Treasury to place this important Chair in the same position as the other Chairs in the University. The members of the Society are glad to find that the directors have already addressed the Treasury in support of the memorial, which meets with the entire and cordial approbation of this general meeting, and direct that a copy of this resolution be transmitted to the Lords of her Majesty's Treasury."

The Chairman said he thought there could be no doubt but the Society would approve of what had been done for the endowment of this most important Chair in the University.

The motion was agreed to.

Professor Balfour said: It will be in the recollection of those present that, at the general meeting of the Society held on the 6th June last, it was agreed to petition against Mr. Holland's Veterinary Surgeons Bill, which excluded anyone holding the certificate of the Highland Society only from calling himself a veterinary surgeon (that title being reserved exclusively for members of the Royal Veterinary College), and it was remitted to the directors to consider the subject of a charter for a Veterinary College for Scotland. With reference to the first matter, it need only be reported that the petition adopted by the Society was sent to every Scotch as well as to several English and Irish members of the House of Commons, and that thereafter Mr. Holland withdrew his Bill. As to the veterinary charter, the committee appointed on the 6th of June, in conjunction with the standing committee on the Society's veterinary examinations, had held several meetings; and at a meeting of directors on the 27th June, a memorial to the Privy Council, signed by the Duke of Buccleuch (the president), was forwarded to the Principal Secretary of State for the Home Department. The memorial prayed for the creation and establishment of a Royal Veterinary College in Scotland. The secretary has since had an interview with the Lord Advocate of Scotland on the subject; but, owing to an arrangement made by the Government, the matter cannot be taken up till the meeting of Parliament.

The petition referred to is as follows:—

Unto the Queen's Most Excellent Majesty, in Privy Council assembled, the Memorial of the Highland and Agricultural Society of Scotland, incorporated by Royal Charter, Humbly Showeth—

That the Society are the patrons of the Veterinary School in Edinburgh, which was established by them in the year 1823.

That the science of veterinary medicine and surgery has been taught and practised in Scotland for upwards of forty years with ardour and success.

That hitherto, in the absence of a regularly chartered College of Veterinary Surgeons in Scotland, having authority to appoint examiners and to grant diplomas in veterinary science and art, the certificate of your memorialists, granted after due examination, has served to confer a certain status on veterinary students.

That this certificate has been recognised since 1838 by your Majesty's Government, and by the Honourable the East India Company, and is the only licence granted in Scotland as qualifying for civil practice in Great Britain and the colonies.

That your memorialists are of opinion that the past history and present condition of the veterinary schools in Scotland entitle them to the highest consideration of your Majesty, and that the independence and usefulness of these schools would be secured, and the advancement of veterinary science promoted, by the creation and establishment of a Royal Veterinary College in Scotland.

That the object of the institution of such a college would be to confer degrees in veterinary medicine and surgery on students who produce evidence of having been duly educated in veterinary medicine and surgery, and prove themselves by examination competent to practise as veterinary surgeons.

That your memorialists humbly but earnestly crave your Majesty's gracious consideration of the above premises; and in the event of this memorial being favourably entertained, your memorialists will be prepared, in concert with other public bodies in Scotland, to submit heads of a proposed charter, and your memorialists will ever pray.

Signed in the name and authority of the Highland and Agricultural Society of Scotland,

Buccleuch and Queensbury, President.

Edinburgh, June 27, 1866.

Mr. M'Lagan, M.P., said there could be no difference of opinion as to the propriety of the proceedings of the directors, but he thought the general meeting ought to do more than read reports, and have them laid on the table. It was well that they should know how the question stood at the present time. They knew that last session of Parliament the noble chairman had also been in communication with Government, and had waited on Mr. Corry on the subject, and that a deputation, headed by Sir William Stirling Maxwell, also waited upon him, and the case had been fairly stated to the Privy Council. The deputation had been led to suppose that the Privy Council entertained the proposal favourably; but shortly afterwards, to the surprise of every one, the Scotch members found that the Veterinary Bill was intended to be pushed through the House of Commons. At last the bill was withdrawn, and a compromise was made that no veterinary charter should be given to Scotland during the recess. The bill would be again introduced after the meeting of Parliament, and it would strengthen the hands of the Scotch members if the meeting would take a decided step in opposing the bill, and also in applying for a veterinary charter for Scotland. If the directors had only known the annoyance to which the Scotch members had been submitted last session in opposing the bill, he would not have required to bring the matter up in that way. They had been informed several times that the bill was withdrawn; and when the Scotch members, on the faith of that information, absented themselves, they were suddenly informed that the bill was before the House. It was only by the closest watching that they were ultimately enabled to frustrate it. They were told that the object of the bill was to improve the education of veterinary surgeons throughout the kingdom; and no doubt that was one of the objects; but the effect of it would have been to annihilate the Edinburgh Veterinary College entirely. They had only the diploma or the certificate of the Highland Society in Scotland, which was recognized both by the Government of this country and also in India; but, according to the bill it was proposed to pass, gentlemen holding that certificate would not be allowed to put V.S. to their names, which would be a most anomalous position for gentlemen holding these certificates to be in, and he thought they should take steps to have them relieved from such a position. Besides the Scotch members who waited upon the Privy Council, they found that other bodies had taken up the question; and the College of Surgeons, the College of Physicians, the Town Council of Edinburgh, and the Chamber of Agriculture, had all petitioned against the bill, and had expressed themselves in favour of a charter for Scotland. It remained for this meeting not only to apply for a charter for

Scotland, but to take steps to frustrate the passing of the bill. They were all aware that the late Professor Dick had left a legacy to carry on a college which he had established in Edinburgh, and that the management of it was vested in the Town Council of Edinburgh. Now, should the Town Council be indifferent in this matter, the Highland Society ought to take the initiative; for veterinary science looked to that Society with the affection of a child to a parent, for it had been fostered in this country already by what this society had done. Now that veterinary science in Scotland was in difficulties, and likely to suffer injury, he hoped the Society would take steps to prevent that injury being passed upon it. Last year, one gentleman had fought against the bill almost single-handed, as representing Miss Dick and certain veterinary surgeons and the agriculturists of Scotland. He hoped no single gentleman would be allowed to do that, but that they would be united in their attack upon the bill. He would suggest that the meeting request the noble chairman to wait upon the Government, immediately after the assembling of Parliament, and endeavour to get them to grant a charter for Scotland; and he had no doubt, if he did so, and was backed by the Society, the application would be successful.

The CHAIRMAN confirmed the statements of Mr. M'Lagan as to the bill of last session having only been frustrated by the constant watchfulness of its opponents at every stage.

The resolution was unanimously adopted.

Dr. ANDERSON reported on the work of the chemical department during the past year, which, he stated, had been unusually heavy, the number of analyses executed for members of the Society having exceeded that of any previous year.

The report was approved of.

Mr. IRVINE, of Drum, reported that since the general meeting in June last the following premiums had been awarded for papers lodged in competition for premiums:

£20 to Robert Hutchison, of Carlowrie, Kirkliston, for a Report on the Dietaries of Scotch Agricultural Labourers.

The Gold Medal or £10 to John Morrison, Coney Park Nursery, Stirling, for a Report on the Best Mode of Cultivating Turnips, with a View to Saving Seed.

The Gold Medal or £10 to John Grigor, Forres Nurseries, Forres, for a Report on the Larch Forests in Scotland.

The Gold Medal or £10 to Christopher Young Michie, forester, Cullen House, Cullen, Banffshire, for a Report on Planting on Exposed or on Barren Tracts.

The Medium Gold Medal or £5 to Christopher Young Michie, forester, Cullen House, for a Report on the Varieties of Poplar best suited to the Climate of Scotland.

The Medium Gold Medal or £5 to Russell Swanwick, Whittington, Chesterfield, for a Report of Experiments on the Comparative Effects of different Special Manures on Wheat, by Top-dressing (Crop 1865), conducted on the Farm of Fentonbarns, East Lothian.

The Medium Gold Medal or £5 to William Walker, Ardhuncart, Mossat, Aberdeenshire, for a Report of Experiments with different Special Manures on Oats, by Top-dressing (Crop 1865).

The Silver Medal to Robert Hutchison, of Carlowrie, Kirkliston, for a Report on the Varieties of Poplar best suited to the Climate of Scotland.

The Silver Medal to Thomas Clark, Craibstone, Auchmill, Aberdeen, for Dressing Fanners, exhibited at the Inverness Show, 1865, and since reported on.

Mr. Irvine further reported on the premiums to be offered in 1867.

Mr. SCOT-SKIRVING said he had great pleasure, not unmingled with some anxiety, in making the proposition he had now to make. He had great pleasure, because he was sure what their opinion would be; he had some anxiety lest the success should not be adequate, or that this meeting should not cordially take it up. A number of farmers principally had been thinking for some years that the obligations under which Scottish agriculture lay to the Rev. Patrick Bell were very great indeed. Many of them would have wished to give him some pecuniary testimonial in proof of their feeling on the subject; but, as his grace was aware, it was difficult for farmers to act in a body, except through some society. The proposal he (Mr. Skirving) was now about to make was that Highland Society should give them, not a grant of money, but what they valued much more, their countenance and support, and the valuable assistance of the secretary in carrying out the plan. It would be necessary to say a few words on the claims of the Rev. Patrick Bell to this honour which he now proposed. The honour of inventing the reaping-machine had been claimed by America, it had been claimed by England, and it had also been claimed by several individuals in Scotland; but a few facts would place the matter before them in its true light. The Rev. Patrick Bell, whom he had not the pleasure of knowing, was far too modest, far too sensible a man to claim to be the originator of the reaping-machine. On the contrary, they all knew that reaping-machines of some kind were used centuries ago; but it was not so old a machine that the records of the world did not let them see beyond. In the very perfect hieroglyphs of Egypt he had seen no trace of a reaping-machine. They had a description given by Homer of reaping which exactly represented a field of Aberdeenshire mowers. But there was no mention of a reaping-machine till Pliny described the fields of Gaul. Pliny stated that the reaper was a large box on wheels, which was pushed into the field by oxen. It was armed with teeth; and these cut off the ears, which fell into the box—exactly what the *Times*, in its magnificent way, told the English farmers to do last wet season. Now, these ancient machines were not entirely forgotten, because he found the eminent agricultural writer, Mr. Arthur Young, in 1785, alluding to them, and proposing that premiums should be given for reaping-machines. Immediately after, two reapers appeared in England, one coming out in 1785, the other in 1786. Mr. Scot-Skirving then gave an account of the various machines which had been produced between that date and 1826, when Mr. Bell's machine was first worked. Mr. Bell was just nineteen when he began to experiment with his machine. He and his brother worked together; and, as they thought they might be considered lunatics, they did not like anybody to see what they were doing. They wheeled a lot of earth into a shed, and set up straws in it, and worked the machine by stealth. When they got it completed, they took it out first in the moonlight. Their experiments cost a great deal of expense; and the only money they ever received was fifty pounds from this society, which did not nearly cover their outlay. In proposing this, he did not ignore the merits of a great many people who had improved upon it; but he claimed for Mr. Bell that he was the first man who constructed a machine which had kept the field. Mr. Skirving showed the great expense which had been saved to the farmers by this machine, and proceeded to say that he did not wish the Society to give a money testimonial, although the Society had often done so as the reward of accomplished success. Mr. Bell was not in a position to attract attention. He was a Minister of the Church of Scotland in one of the poorest parishes, and he believed a pecuniary reward would be more agreeable than if he were a richer man, although rich and poor alike deserved reward for their good deeds. All he asked was that they should empower the secretary to work the machinery so far as sending out circulars and receiving the contributions were concerned. With that courtesy and kindness which he was sure the members generally experienced at the hands of their new secretary, he had intimated that he was perfectly willing to undertake the duty, provided the Society would allow the small expenditure that would be necessary in employing for a short time an additional clerk to address the letters, &c. He (Mr. Skirving) therefore proposed that the Society should take up the matter, so far as to allow the secretary to send out the circulars and receive the subscriptions.

Professor RANKINE, Glasgow, in supporting the proposal, said it was the general impression among engineers that Mr. Bell occupied the same position in relation to the reaping-machine as Watt did in relation to the steam-engine. All the reaping-machines that were invented before the days of Bell turned out to be failures, and it was his invention that had rendered them successful, just as in the case of Watt with the steam-engine; and all improvements that had since been made on the reaping-machine were merely modifications of that of Bell, as the improvements on the steam-engine were modifications of Watt's engine.

The DUKE of BUCCLEUGH then put the motion to the meeting as follows: "The meeting approve of the proposal to raise a testimonial to the Rev. Patrick Bell by public subscription, and authorize the secretary to give his assistance to the gentlemen who are promoting it." The noble Duke said that the first time he attended an exhibition in connexion with the Highland Society, he recollected perfectly well seeing a model of Mr. Bell's reaping-machine on the ground. He was very young indeed at the time, but he remembered hearing many people say of the machine that it might work well enough as a model, but would not be capable of performing the work of the field, because it would be impossible to get horses to push the implement before them. The machine, however, had not only been found practicable to work with, but it was actually used to cut a line to allow other machines to work. He thought the country was under a deep debt of gratitude to Mr. Bell for having worked out his idea in such a way as to have rendered the reaping-machine a great success; and the Highland Society ought to do what they could in order to express their feelings of gratitude to one who stands, as had been well remarked, in much the same position in regard to reaping-machines as Watt did to the steam-engine.

The motion was then put to the meeting, and carried with acclamation.

On the motion of Mr. Heddle, a vote of thanks was given to the Duke of Buccleuch for presiding, and the meeting separated.

AGRICULTURAL STATISTICS AND A BOARD OF AGRICULTURE.

At a recent meeting of the Dorchester Farmers' Club, Mr. George Homer read the following paper:— Statistics have been described as that department of political science which is concerned in collecting and arranging facts illustrative of the condition and resources of a state. In order to legislate wisely it is necessary for a Government to obtain correct information on all those subjects upon which they are required to legislate. Sound statistical information is therefore indispensable to sound legislation, whether the subject relate to agriculture, manufacture, or commerce. Partial or limited statistics can never impart sound information. They can only lead to injustice and deception. The bulk of multifarious quality can never fairly be represented by sample; it is necessary to have full and complete returns where the qualities are so various. McCulloch says: "Observations are scarcely ever made or particulars noted for their own sakes. It is not until they begin to be in request, as furnishing the only test by which to ascertain the truth or falsehood of some popular theory, that they are made in sufficient numbers and with sufficient accuracy." And for the collection of them in sufficient numbers, and with sufficient accuracy, nothing less than the authority of Government is required. It is equally evident that, upon all subjects on which they are called to legislate, requiring such extensive information, it is their bounden duty to obtain it, care being taken that all unnecessary exposure of private circumstances should, as far as possible, be avoided. The observance of such rules as these will go far to do away with the objections which have been urged against the collection of statistics; indeed, it may be asked, why should exposure be feared in this case more than in those of the adjustment of poor-rate or income-tax? Until lately very little importance has been attached to statistical inquiry; but recently the more careful study of political economy has brought out its importance, and almost every civilized nation addresses itself to the subject. Indeed it has been said that the civilization of a country may be measured by the completeness of its statistical returns. There is in this country a statistical department in connection with the Board of Trade, the province of which is to arrange the collection of statistical evidence on all subjects required by the Government. The most ancient statistical record in this country is the Domesday Book, completed in 1086, and this work, as might be expected, at a time when manufacture and commerce were in their earliest infancy, has special reference to agriculture. It contains a complete record of a survey of the whole country, giving the names of the owners of all lands, the number of tenants and others of various ranks and callings, the quantity and value of lands, and whether in forest, pasture, arable, or waste. In some counties the numbers of cattle, sheep, swine, and working horses, are given. Surely it is somewhat strange that, although nearly 800 years have passed, this continues the most complete survey of the whole country yet made. This fact alone speaks volumes as to the fertility of our resources, the industry of our farmers, and the bounties of Providence towards us. Had periods of scarcity and famine been frequent this important subject would not so long have remained in abeyance. It is useless to attempt to disguise the fact that this question has been a most unpopular one with the agricultural body. The principal causes which have led to this feeling are, I believe, the following: Firstly, the injudicious way in which it has been proposed that agricultural statistics should be collected. Secondly, because those at present collected are, either wilfully or from apathy and ignorance, most deceptive, and calculated only to mislead and to injure. Thirdly, the little confidence felt by agriculturists in that department of the Government to which their interests are confided—I refer to the Board of Trade. The schemes proposed for obtaining agricultural returns have been very numerous, and all that I have seen contain some objectionable feature. In a Bill brought into the House of Commons by Mr. Caird it was proposed "that in case the occupier did not make the return, any person duly authorized by the Board of Trade might, after three days' notice, take the necessary steps for obtaining the required information by other means, and for that purpose enter upon the land without being liable to an action for trespass!" In a Bill which passed the House of Lords the compulsory clauses were still more objectionable. Again it has been proposed that the County Police Force should be employed in this work, the plain inference being that whilst these country gentry are looking after rogues and vagabonds on the one hand, and estimating the derelict crops of husbandmen on the other, they are engaged in employments very nearly akin. Surely it can be no impossibility to frame some practicable measure free from such objectionable features as these. I have said that the statistics of agriculture at present collected are false and deceptive, and in saying this I specially refer to the system at present adopted of arriving at the corn averages. I need not further insist upon the necessity of correct returns, since on these are founded the varying annual amount of tithe rent-charge, the corn rentals of farms, and the valuations of outgoing and incoming tenants. This question was so ably brought before you about two years ago, by a gentleman whom I now see amongst us, that only the great importance of the subject justifies me in reviving it. It was then clearly shown that not one-half of the wheat grown in this country found its way into these returns, less than one-fourth of the barley, and even far less than that proportion of oats; that the corn which got returned was nearly all of superior quality, and consequently that the average of prices was far above what they ought to be. The arguments and facts brought before you were so unanswerable, and so convincing, that this club, in common with others, presented a memorial to the Board of Trade upon the subject; and with what result? At that time the returns were professedly made from 290 towns, which number was rather more than half of the corn markets of England; but of that number some were shown to have dwindled to comparatively small dimensions, and others were obsolete. Our memorial to the Board of Trade, asking for more complete returns, was answered (and I would call particular attention to the fact) by the reduction of the number of 290 towns to that of 150. Upon what principle, I would ask, can the smaller number of market towns carry the more complete returns? If this be the reply of the Board of Trade, how can we interpret it but by calling it mere mockery? Let us examine how this system works in the adjoining county of Wiltshire. In that county there are but two or three towns where these returns are made, and in these markets (perhaps on account of convenient railway accommodation) higher prices are generally obtained than in other and smaller markets. In consequence of this, and from the important fact of none of the secondary qualities finding their way into the markets, the corn averages in ordinary seasons stand at several shillings per qr. more than the average prices actually obtained or obtainable by corn growers. This is the case in ordinary seasons; but this year, from special causes, the injustice is of peculiar magnitude. You are aware that but a small proportion of the barley grown this year in Wiltshire was harvested in a fit state for malting purposes, by far the greater proportion of it being deteriorated in value by the weather to the extent of about 20s. per qr. In order to obtain correct averages it would be necessary that the various qualities of barley should be returned in the same proportions as they were grown. But what is the real state of the case? The returns are made up partly upon the barley grown in that neighbourhood which was harvested with but little or no injury from weather; but in a large proportion upon the choicest samples of Dorsetshire barley taken to these markets for sale by growers and dealers. There can be no doubt that the corn averages for the county of Wilts will, for barley, stand at from 10s. to 15s. per qr. higher than the actual market value of Wiltshire barley. You know that it is customary for an incoming tenant, upon taking off a crop, to pay for it by the averages of a neighbouring market. Thus a tenant, entering upon a farm, say in the neighbourhood of Warminster, would now, by the averages of that market, have to pay for the barley crop which he takes off from 10s. to 15s. per quarter more than the average value of the barley grown in the county of Wilts. Can we imagine a merchant, a manufacturer, or even a tithe rent-charge proprietor, remaining passive, under a grievance so patent and so painful? And surely if the patient endurance of the bucolic mind can suffer such injustice without demand for reparation, it is worthy of all the ignominy which it ever and anon receives. In order that the most reliable information may be obtained, and also that it may be rendered in the most practical form, it is needful that the authority engaged in the work should have a competent knowledge of the subject itself, as well as of the object it is intended to secure. Now if we are to judge by the treatment which farmers have received from the Board of Trade, we can come to no other conclusion than that they possess neither the one nor the other. As an illustration of the judgment that they have not understood the subject itself, I would simply refer to the returns called for by them in the spring of this year, in which they required the number of neat cattle, calves, sheep, and lambs kept on each farm. Now this return, be it observed, was to be made at that particular time of the year, viz., the calving and lambing season, when a farmer might possess ten, or even twenty, per cent. more live stock in the evening than he did in the morning. That they are honestly ignorant of, or wilfully indifferent to, the object aimed at by accurate statistics, has been already sufficiently illustrated by the manner in which the corn averages are taken. Is it wonderful that the agricultural body should have so little confidence in that department of Government which manages these affairs? "The powers of labour and of the other instruments which produce wealth may be almost indefinitely increased by using their products as the means of further production." Any one can see with what force this observation applies to manufacture. The results of agriculture are not susceptible of the same unlimited increase. The truth of this proposition is seen in the extensive advance of the manufacturing interest of this kingdom as compared with the agricultural. And yet such is the nature of agriculture that it loses not one iota of its importance, even comparatively, towards the body politic. But the details of the working of the two interests are so dissimilar, that it would be almost impossible to find a man equally qualified for the superintendence of the one and of the other. The beneficial offices of a Board of Trade no one would attempt to deny; but we may well question its utility when transformed into a Board of Agriculture. The latter is needed as much as the other: but they cannot be blended into one department without the suffering of either the one or the other. Now we think we have good reason to complain that in recent legislation the interests of agriculture have been too much disregarded, while those of commerce and manufacture have been treated with favour. The Board of Trade may be in truth and in efficiency what its name imports; as a Board of Agriculture also, we deny its qualifications. It has been said that it was rather the province of a Farmers' Club to point out a grievance than to suggest a remedy; but in this case the course is so plain that it would be mere affectation if we did not state at once what we require, viz., that a Board of Agriculture should be formed, separate and distinct from the Board of Trade, with its President taking part in the Councils of Parliament, as well as in the Councils of her Majesty. To such a Board we might unhesitatingly confide our interests. My purpose now, gentlemen, is to shadow forth to you what I conceive to be the proper plan of collecting agricultural statistics. I have before stated that it is necessary for those employed in collecting statistics to have a competent knowledge of the subject on which it is proposed to collect facts. For my purpose I will take it for granted that a Board of Agriculture is formed, possessed of the necessary qualifications for its office. Local knowledge and authority are requisite also for the completion of the scheme. Perhaps we could not find more competent bodies for this purpose than Boards of Guardians, since they are generally selected as men of business, and represent every parish in the kingdom. Their imperative duty would be to collect from every farmer in the union the acreage of his corn sown. Let the Boards of Guardians elect an appraiser of quantities, who should proceed to estimate the per-acreage growth from a general survey of crops. The farmers' returns he would have to make up and send to the Board of Agriculture a week before the harvest. Be it observed that under the proposed arrangement, private affairs would not be exposed to individual members of the Boards of Guardians, they would be known only to the appraiser, who might be sworn to secrecy. As it regards live stock, each farmer should be requested to fill out a return of all that is on his farm at Michaelmas in each year, and send it to the Board of Guardians, and with regard to these returns it should be the duty of the appraiser to sort and arrange them so that they may be presentable to the Board of Agriculture. We now come to the question of the corn actually grown in the country, and its actual market value. I propose that every farmer should keep an accurate account of all corn he has disposed of throughout the year, and at a specific time make a return thereof to the appraiser. It may possibly be thought that the farmer would consider this duty too onerous; but it must be remembered on the other hand that he would scarcely neglect it when he considers that his interest is so deeply involved in the correctness of his account. Then as to the corn consumed at home, which is generally of the inferior quality, a mixed sample might be furnished to the appraiser, that it might appear at his valuation in the returns to the Government. I would now endeavour to concisely sum up the advantages which would accrue if Agricultural Statistics could be collected in an accurate and popular manner. First of all then, it would tend to ensure correct legislative action on the chief questions of the day affecting the farming interests, such as the malt-tax, the basis on which our rates are collected, and the rules and precautions to be adopted with regard to the importation of live stock. It would tend to equalise prices, and prevent excessive importation or exportation of grain. It would afford most valuable information on what is becoming a most important question—the demand for and supply of agricultural labour, and would open the eyes of landowners as to the imperative necessity of providing more and better habitations for the labourers. It would assist in arriving at correct conclusions as to how far machinery may be profitably exchanged for muscular labour, and one rotation of crops substituted for another. It would afford correct data on which rent charges might be assessed, corn rents paid, and crops be taken by valuation. Lastly, and above all in a political point of view, it would furnish Government with the means of estimating and supplying the wants of the people, and thus go far to secure plenty, peace, and prosperity to the nation at large.

Mr. **Andrews** said he would be glad to know in what way agricultural statistics could be obtained in a manner satisfactory to the farmers at large, and also so as to give that information which was required. He did not like the idea of an appraiser, for he should have a very great objection to anyone valuing his property, and he thought the question of statistics was one on which it was almost impossible to get a unanimity of opinion. That want of unanimity had been the great curse of agriculturists, for they never had agreed on any one point. The reason was, that A knew that his landlord was favourable to one view, while B's landlord took another view, and unless the occupier held a lease on his farm, he would scarcely give his own opinion freely, for should that opinion be adverse to that of his landlord, he might get a little reminder from the steward "wondering how he could be so careless as to make such a statement;" or, if the landlord took a personal interest in it, he might be told, "I want to have a little talk with you on that subject; I am quite of a different opinion, and think what you stated was entirely wrong;" so that, unless a certain amount of independence could be secured, they would never arrive at a practical conclusion. Whatever may be said about having good landlords, the first thing for the farmers to obtain, in order that they may be able to express their opinions fairly, must be leases of their farms. With respect to the Board of Trade, they could not expect that that body, composed entirely of gentlemen interested in trade, and trade alone, would take a proper view of agricultural questions, for they cannot even be got to understand what it takes almost a lifetime to learn (although everyone fancies that he can be a farmer, and give advice to a farmer). Therefore, it becomes the duty of every agriculturist, where he can do so, to give his close attention to matters relating to agriculture, and then really and truly to express what his opinions are. Without entering into politics, he would urge them to give their support to members of Parliament who would devote themselves to agricultural subjects.

The CHAIRMAN was sure everyone must have listened with the greatest possible pleasure to the address which Mr. George Homer had been so kind as to give them; and, in order that the matter might be thoroughly discussed, he would divide it into three heads by getting three resolutions proposed: First, as to the desirability of establishing a Board of Agriculture; secondly, as to corn averages; and thirdly, on the mode of getting a good system of agricultural statistics. First, as to whether it is desirable that a Board of Agriculture shall be established. Mr. Homer had well explained the manner in which any proposition emanating from them is received; and why? Because they were only a club, representing a portion of a very small agricultural county, so that they must get the best information they could, and then stir up their members of Parliament, for they had no one else to apply to. And to this end, they should get other clubs to join them. He proposed: "That it is desirable that a Board of Agriculture be established by the Government, which should take the management of all matters relating to that branch of the national industry."

Mr. GALPIN seconded the resolution. He agreed with Mr. Homer, that the Board of Trade was hardly the body to which farmers should look for the redress of grievances, and for considering subjects relating to their interest; but he had hopes from the Chambers of Agriculture which are being formed, that through them they might get such a Board of Agriculture as exists in several foreign countries. He was surprised that in England, a country which depends so much upon agriculture, the subject had not been long before this time brought before the Legislature.

Mr. DAMEN quite coincided with the resolution. It was not a new opinion of his that the Board of Trade had neglected all agriculturul affairs. When they were asked for more complete returns, they took off one hundred and forty from the number of towns making those returns. Farmers' interests had had little attention, except the imposing of new taxes, and things of that kind. For years past, trade and commerce had engrossed nearly all the attention of Parliament. There was a time when agricultural members were supposed to have the predominance; but that time has gone by, and now agriculturists must bestir themselves, for their interests would never be thoroughly entertained without a proper agricultural Minister; and why should not agriculture have its special Minister, considering its immense importance to the country?

The resolution was carried unanimously.

Mr. DAMEN proposed the second resolution with respect to the corn returns. He felt much obliged to Mr. G. Homer for the way in which he had introduced the subject, so that it needed scarcely any further remark. They were aware that the returns now made are the most fallacious possible. Only about 75,000 quarters per week are returned as sold in 140 towns, or about 3,750,000 a year, whereas the wheat grown must be something like 12,000,000 quarters, because they know the consumption of 30,000,000 people would be about 20,000,000 a year, for a person will consume a pound of wheat per day, giving about 6 bushels a year, and, as a sack of flour produces 90 loaves, the consumption must be at least 20,000,000 quarters a year, making allowance for Indian corn used in some parts and oatmeal in Scotland. The importations for the last ten years had been in round numbers 7,500,000 quarters a year, therefore about 8,000,000 quarters could not have been returned at all, and the present statistics could not be relied on. Many might contend that these facts are not useful; but it would be monstrous for the Englishman to be kept in the dark as to how he is fed. In foreign countries, as in France, they have the most perfect returns, and so they know immediately if there is enough food for the people, or how much it is deficient; and they had even come into England, and bought large quantities, while we have had afterwards to purchase to make up our deficiency at much higher prices. It was much better to have a fair price, and no class were injured more than agriculturists themselves; for every now and then a feeling would go abroad that we want wheat, and more is imported than we require, then that must be sold at any sacrifice, and this keeps prices down. Agriculturists would therefore be benefited more than any other class of the community by reliable statistics. As to the possibility of obtaining such, he thought Mr. G. Homer had shown that nothing is more easy, and what could be better than that Boards of Guardians should meet and fix the returns? They might not be exactly right; but if done every year, they would be near enough. He had a great objection for the police to be so employed, and wished there were no necessity for any policeman. In other countries, where there is not that great middle-class that exists in England, everything must be done by the police; but as a freeman and an Englishman he wished they could be done without. In Scotland returns had been collected for many years by the Highland Society of Scotland, and until the Government interfered, there was no reason for questioning them. In Ireland, also, although he admitted by the police, it had been succesfully done. And why could not some satisfactory plan be adopted in England? Memorializing the Board of Trade would be, he believed, of no use, if they could not get their agricultural members to interfere, and it seemed a proper preliminary to get an agricultural board, because now, except the county members, they seemed to have no one to whom to appeal. Mr. Damen then moved "That the present system of obtaining corn averages is altogether objectionable and most irregular." He knew that it was so, because he had known millers who had boasted that they never made a return in their life. There was, it is true, a £10 penalty for not doing so; but he never knew of but one person who was summoned for it. Of barley they knew something from the consumption. 75,000 quarters per week are returned in six months. Yet 5,000,000 quarters are malted in this country, and everyone knew that double the quantity is ground. In conclusion, he expressed his opinion that it was only a question of time before the present prejudices would be worn away.

Mr. CHAPMAN SAUNDERS briefly seconded tbe resolution, which was unanimously carried.

Mr. GALPIN remarked that the returns are now made from the buyers; but a large quantity of corn goes into consumption without passing into buyers' hands, so that if the whole of the corn sold were returned, they would not know the quantity grown. Suppose they wanted the prices of corn for purposes of the tithes, &c. A farmer might grow 100 quarters of wheat and sell 70 at a good price, and the other 30 quarters would not be returned at all. How would they get the value of that?

Mr. DAMEN said it would be very difficult unless buyers and sellers both make returns. If they did this to the same office, any discrepancy would be discovered. But in all market towns the Corporation should have some supervision, and could look after the buyers, every one of whom was known, and if one or two persons in each town were appointed for this purpose, there would be an immense improvement, and he believed it would answer all purposes.

Mr. T. H. SAUNDERS asked, if the seller were to make no return, who could know how much secondary wheat is grown? He sold a great quantity of secondary corn, and how were they to pay tithes on that? A farmer ought to be entitled to make a return of all his corn grown, and should not let it go forth before harvest that they had not enough corn, because the merchant would be sure to obtain sufficient, and then they would have a bad crop at a low price.

The CHAIRMAN remarked that Mr. Homer had proposed that the crops should be submitted to an appraiser. The seller should not make the return, because he would be interested in keeping down the average. If the present £10 penalty on the buyers for not making returns was not enough, let it be £50, for every buyer should be compelled to make a correct return.

Mr. H. **Lock** did not approve of a person being appointed valuer. The farmer should make a return at the end of the year of what he actually got for the corn sold (No, no). It was not fair to the community that the corn consumed by pigs should be brought into the average. If the wheat was so inferior that it could not be made into bread it ought not to go into the returns. Corn sold to the labourers who consume it for bread should be brought into the return at the end of the year.

Mr. J. **Homer** thought it was the farmer's own fault if the inferior corn were not returned.

Mr. **Clements** said he was in Kent the other day, where the labourers were said to be receiving 15s. per week. Upon inquiry he found that they actually received the 2s. 6d. per day, but had to pay 2s. per week for their cottages. In Dorset they paid 10s. or 12s. per week, but, taking into consideration the cottage rent-free and the remuneration in kind—as grist at 5s., gardens and potato ground, &c.—the labourer was equally well paid here. But he believed farmers would find it as much for their interest, and give more satisfaction, if they paid the higher wages, all in money; and let it be paid weekly, and on a Friday night.

Mr. J. **Homer** said the first question was, Will this collection of agricultural statistics be a benefit to the community at large? Supposing that Parliament carried a measure that the corn statistics of this country should be taken, could they be obtained in such a manner as to make good ground for Parliament and corn speculators to act on? If they had a better harvest than usual, and grew 14,000,000 quarters, it was doubtful whether 8,000,000 would be brought into the market that year, because, whenever low prices prevailed and the quality was good, it was customary to hold it over on speculation. Next year there might be a bad crop, and statistics would not be taken till about a week or so before harvest; but long before that the farmers would know whether they had a good crop, and the corn-factor would discover what the prospect was; and is it not likely that the whole Continent of Europe would know before the statistics were taken? He believed it would be known before the statistics were in possession of the Government. Therefore he doubted whether the community would gain the expected advantage from statistics. Mr. Damen had quoted France; the French Government, knowing nearly what quantity of corn is required, obtain sufficient for the food of the country. But France is not a free-trade country, and while England goes to the cheapest market, and sells in the dearest, in France he believed they had sometimes prohibited the exportation of corn, so that he believed we should not be in a better position unless we could get fairly at the whole consumption, and that the produce were to be consumed the same year. But who could make the farmer bring his corn to market in the same year. Supply and demand would govern him at all times. But he would be the last, if it were for the benefit of the country, to say that statistics should not be taken. They would most likely differ on the mode in which it should be done; but he would give them his own thoughts. That district surveyors should make returns to Government was very objectionable, he thought, and nothing would be so correct as to take the estimates locally. If two men were appointed to look over a union, would they know the quality of the land, and what it would produce, as well as a man who lived there all his life? He would propose that a vestry should be held a fortnight before harvest, and one or two men be appointed to look over the parish, and send in their estimate of its produce in gross, stating the number of acres of wheat, barley, oats, pulse, &c., which return should be sent to the clerk of the Union, who should add up the returns for the whole union, and make a gross return to the Board of Trade, or the proposed Board of Agriculture, so that no names or particulars but the gross totals should reach the Board. For a wet harvest, of course, there must be an allowance made. This would do away with anything inquisitorial, to which there was so much objection, for only the parish officer would know who had the best corn. Mr. Homer then proposed the third resolution, "That a well-considered and accurate system of collecting agricultural statistics would materially further the cause of agriculture, and be beneficial to the country at large."

Dr. **Aldridge** seconded the resolution, thanking and complimenting Mr. G. Homer for his manner of introducing one of the most interesting subjects that could be brought before the Club. If their representatives had neglected the interests of agriculture, it was because farmers had not furnished them with proper statistics to legislate on to some purpose, and he urged them to use their influence to get such statistics, in order to obviate, perhaps, a great crisis happening. Although they were a small club, they must not despise small beginnings, and if the ventilation of this subject should commence through the Dorchester Farmers' Club, and their friend Mr. Homer, it would be a great honour to the town, and the whole county.

Mr. **Damen**, in reply to Mr. J. Homer, thought that, except in a few favoured counties, very little corn could be kept in the farmers' hands. They were either too poor or too prudent to do so, and it was a fact that, after two or three harvests with low prices, scarcely enough was ever left for three months' consumption, and the usual fault, if any, was to sell much too early. It showed the necessity of statistics that the price of corn varies more here than in any country in the world. It is true that corn factors do get information of short supplies; but if they had proper facts to go upon, they would not import at a loss. He disagreed with the plan of the farmers valuing their own produce; when he was a young farmer he found he often estimated his crops at two-thirds more than they produced, and there was amongst others a tendency to estimate the crop less than is. As to two persons valuing the parish, he had heard that there could not be two great men in one parish; but if there should be, he considered great numbers of the growers quite incapable of valuing their own crops, and it was better to leave it to people quite above suspicion. The estimates should also be taken twice, before and after harvest.

Mr. J. **Homer** thought his good friend Mr. Damen had a poor opinion of a man if he were open to a suspicion of making a false return. If done by the Board of Guardians, two of them must value their own parish as well as the others in the union; and they would ride over every other person's corn, for they never walk, and he should have a great objection to a man riding over his corn. No stranger could value his corn as well as he could himself, knowing the quality of the land, for one piece of land might show as much straw as another; but the person acquainted with its quality would know there was a great difference in the quantity of corn.

Mr. **Galpin** congratulated Mr. G. Homer upon the subject he had introduced, and the very lively discussion. He had always been an advocate for agricultural statistics, and would willingly send in a return like that to the Inland Revenue about their cattle; but he objected to send returns to the Board of Guardians, because the farmers on that Board reside almost in every parish, and some would be his next door neighbours, and in case of his leaving his farm would be his competitors, so that he would rather send to a totally indifferent person, and the same objection applied to Mr. J. Homer's plan.

Mr. J. **Homer** explained that he wished only the totals to be sent in, and without the names of the parishes, while the unions should only send up their totals in gross.

Mr. G. **Homer** replied to the remarks on his paper, and a cordial vote of thanks was presented to him.

A discussion followed on the propriety of memorialising the Government to establish a Board of Agriculture, and it was agreed that the secretary communicate with other farmers' clubs known to them, and with the Central Farmers' Club, in order to obtain their co-operation.

LARGE CROPS OF WHEAT.

Sir,—The discussion about the peck of wheat per acre, the laughter and disbelief about 7 quarters of white wheat or 8 quarters of revett wheat per imperial acre, present to my mind a painful sense of our national agricultural humiliation; because, if those sneers and laughter are honest and genuine, it proves that small crops are the order of the day, and that crops such as I have described are very uncommon, and produced at very great cost. I also come to be convinced that great corn crops cannot be grown by the ordinary thick sowing, and that this thick sowing is a national calamity, owing to its injuring and diminishing the crops. I know and expect that this statement of my honest conviction will raise a fresh storm of doubt and disbelief, but I will nevertheless calmly give my reasons for coming to such a conclusion; and, first, when I recommend high farming, I am very frequently told "that it is all very well for root and green crops, but that it won't do for corn, for we get our crops laid prematurely, and the quality and quantity both injured if we farm so high." But it seems never to have occurred to such persons that the real cause of disaster in such cases is not too much manure, but too much seed. The roots of the thickly sown plants, when the rootlets attempt to extend and ramify, meet with opponents having the same requirements; a grand battle ensues as to which shall have the greatest number of soil granules, and, as in all other battles, the weaker perish, and the victors are either crippled or injured. There can be no more mistake about this than about an over-thick or unthinned plantation, or a crop of unhoed and unsingled turnips. Liebig justly says that the greatest enemy to a wheat plant is another wheat plant, for the very obvious reason that they both require identical elements of food. Small heads and kernels and weak flabby straw are the natural consequences of this competition.

I never heard one of my own labourers say that I farmed too high for wheat. Well, then, I assert confidently that one main cause of small grown crops is thick sowing, and that however rich your soil, you can rarely obtain a great crop with the usual quantities of seed sown. There are several awkward attempts at correcting this evil; first, by sowing late, and secondly, by "flagging" the wheat at certain periods of its growth. A money-making high farmer (an old friend of mine) who grows 400 acres of wheat annually, employs a whole gang of men in flagging all his wheat, and very often all his oats and barley. This is done, when the broad or flag leaf is well-grown in June, care being taken to avoid cutting into the sheath that contains the ear. He knows quite well that unless this were done the crop would be prematurely laid and greatly injured. By this flagging the stem is relieved of weight, and stands more erect, the air and light are thus admitted to the lower portion of the stem, the overhanging canopy of flags no longer shuts in the damp, and no longer prevents evaporation or causes mildew. All this is rendered unnecessary by a more moderate quantity of seed. Let it be well understood that I lay down no fixed rule of quantity, but merely commend my brother-farmers to try on a small scale comparative quantities, so as to arrive at conclusions suitable to their very various soils and climates. Now, when a man sneers or jibes at one peck of seed per acre on heavy land, or even at my general quantity of one bushel per imperial acre, I know at once that he has never tried it, and therefore knows nothing about it, having had or seen no experimental facts on which to form his opinion; and, therefore, instead of being angry, I can only pity or regret the absence of a more sound mode of arriving at a just and safe conclusion. I plead guilty to being an agricultural disturber in this matter of thin sowing' and so long as I live and have my faculties I will continue to deprecate erroneous agricultural practice, with the sole and earnest view to benefit and elevate my country. But, eschewing motives, let us see what there is extraordinary in growing 7 quarters of white wheat, and then from 6 to 8 quarters of Revett, on the same ground in two successive years, the land being poor stiff heavy land, and the season suitable to such land, namely, plenty of sunshine and not too much moisture, such as 1864 and 1865. "Oh! but then you take wheat after wheat, Mr. Mechi, which we dare not do."

Let there be no misunderstanding about this. I know that many who make this remark and farm high, take barley after wheat, and get it of better quality as well, under their system of thick sowing, than taking it immediately after turnips fed off with cake. The land has less "branching" force after the removal of the wheat crop.

Now, although I take two wheat crops, the kinds differ almost as much as wheat and barley. I never attempt to take two glassy wheat crops in succession. I know that they would fail because the silica is not dissolved in time for a second glassy crop; but, as a second crop I take the pithy-strawed non-glassy bearded revett, which gives, on our stiff soil, a larger return than barley.

But then I am convinced by practical experiment that I should be unable to obtain 7 or 8 quarters from 2 or 3 bushels of seed, although I frequently do so from 4 pecks or even from 1 peck. These conclusions have been arrived at by careful experiment. For several years I tried 1 bushel of wheat per acre, against 2 bushels of wheat per acre—both drilled. The difference in favour of the 1 bushel was equal to a rent of 30s. per acre. This settled the question so far as my heavy land was concerned, but every man must judge for himself, not by imagination, but by experiment. Whenever we hear of very great yields, it is generally from a very thin plant that was almost condemned to be ploughed up in the spring—a branching crop is almost always a good one; but thick sown cannot branch—there is no room or power for this. As to manuring, I keep plenty of live stock, and so make much manure.

I use 2 cwt. of Peruvian guano, mixed with 1 to 2 cwt. of salt as manure for wheat after beans, or roots drawn off, and also for revett wheat after white wheat. So much does a warm dry summer benefit our heavy land, that in 1865 my 40 acres of heavy land wheat averaged 7 quarters per acre—not farmers' acres, but really and correctly measured acres. After a crop of mangel I got 7 quarters, and after beans 7 to 5 bushels of red wheat, and after 7 quarters of white wheat 8 quarters of revett.

In conclusion, it must not be supposed that I recommend a general seeding or sowing of 1 peck an acre of wheat; but the success during three years of such a quantity proves that a great reduction in the absurd quantities usually sown may safely take place. A bushel an acre on my heavy land is more than is required, and leaves an ample margin for slug or other damage. The peck an acre has, however, in my case, surpassed the bushel in yield of corn and straw two years out of three.

My object is to induce agriculturists to try reasonable comparative experiments, which as men of business they are bound to do, and not rely upon antiquated quantities only suited to a state of things either long since passed away, or gradually changing. Broadcast quantities are not suited to modern drill culture.

That there is need for great amendment is clear when I am even now frequently told, "We always put in 7 bushels of oats, 4 of barley, and 3 of wheat." Take heed to local measures, for at Carlisle some farmers told me, to my surprise, that they only put in a bushel of wheat,but I soon found that a Carlisle bushel is equal to 3 imperial bushels.

On very light land, where wheat does not usually branch freely, more seed is required, especially where subject to wireworm and frost. In this case plenty of salt, some rape-cake, and compression are more beneficial than too much seed. Salt not only removes wireworm, but protects the roots against frost.

I hope that another year, instead of silly sneers and misstatements, I may receive a list of carefully conducted experiments from various districts and differing soils. On poor miserably farmed undrained small fields, shut in by immense weed-growing hedges, and robbed by the roots of worthless pollards, a good crop can scarcely be expected, be the quantity of seed large or small. Unfortunately I know of too much such land.

J. J. MECHI.

Tiptree, Jan. 1.

I take this opportunity of wishing many happy and prosperous years to my brother-agriculturists. In our county wheats promise particularly well, and the land is altogether in a more fit condition than at the same period last year. Let us therefore hope for a good crop and a fair price.

THE MAINTENANCE OF TURNPIKE ROADS THROUGHOUT THE KINGDOM UNDER THE PRESENT SYSTEM.—A paper on this subject, by Mr. Kinneir, a solicitor, was read at a meeting of the Hungerford Farmers' Club, when the following resolution was unanimously agreed to: "That the object for which turnpike trusts were established having ceased in consequence of the introduction of railways, this meeting is of opinion that they ought to be abolished, leaving it to the Legislature to devise means for the liquidation of existing debts." Certain M.P.'s had been invited to attend, but apologies were read for their absence.

CHIPS.

The subject we propose to discuss in this paper, and possibly in one or two succeeding papers, is *the principles which regulate the operation of the most important of our agricultural implements and machines,* basing our remarks on a very elaborate paper on agricultural engineering which has recently appeared in a portly and magnificently-illustrated volume, issued by the Messrs. Fullarton, of London and Edinburgh, and which treats of the most important branches of engineering and machine-making; and we have, perhaps, no more striking illustration of the position to which agricultural engineering has of late years attained than the fact that in a work like this, addressing itself to engineers and machinists, on branches of their calling in every sense special, so prominent a place should be given to the discussion of the subject which forms the basis of our "Chips"—a subject which but a few years ago would have been deemed altogether without the province of the general engineer and machinist, and, indeed, to which the elaborate paper could not have been devoted, and illustrations for which would have been meagre in the extreme, the examples of agricultural machines and implements being at that time confined to but some half-dozen or so, as, to wit, the plough, the harrow, and the roller, in field implements, and the fanners, and the simple form of thrashing machines in barn machines. Now, however, this condition of matters is so completely changed that in the long and widely-diversified array of machines and implements which aid the labours of the field and the fold, there is matter afforded as the subject of special volumes, and elaborate papers like the one from what, so to speak, we are now about to "strike off some chips."

The writer sets out by remarking that, although much attention has been recently, and is daily becoming more and more, paid to the subject of agricultural engineering, it must not be looked upon as in a fixed, but rather as in a transition state, and that the probability is that we are entering upon a period in its history when, by the application of juster and more correct principles, a practice will be inaugurated, as remarkable for its results as the period which has been passed through during the last twenty or thirty years. It is to a statement of what those principles are that the writer devotes his paper, and which takes up in regular sequence the following subjects:—(1) "implements used in the cultivation of the soil;" (2) those connected with the sowing and (3) with the cleaning and hoeing of the crops; (4) those with the reaping of the crops; (5) machines for preparing produce for market and (6) food for stock; and (7) "for the making of butter and cheese;" and concluding with (8) remarks on the sources of power for performing the works of the farm.

Under the first head the subjects discussed are (1) the plough in its various forms of swing, wheel, turn-wrest, and subsoil; (2) the grubber and cultivator; (3) the roller; and (4) the application of steam in the working of these. The implements of the farm used in the preparation or culture of the soil for the reception of seed are found exemplified in what may be called the rudimentary forms of the plough, the harrow, and the roller: of these and from these there are, of course, many modifications and offshoots, but in all of them the rudimentary principles of operation are exemplified. Let us glance briefly at what these are, and first as to the plough. The main feature of the operation of this the oldest and most honoured of all our farm implements is the manner in which it cuts the soil, and thereafter turns the slices so cut over at a determinate angle; this principle of under-cutting and turning over, so as to ensure a complete inversion of the slices, is that which distinguishes the plough from all other implements used on the farm. The following diagram and description, which are given by the author of the paper, will make this principle, we think, clearly understood. Suppose *a b*, *c d* (fig 1) to represent the slice which the plough cuts off from the land, which is supposed to stretch from an indefinite length. The side *a b* is termed the "land side," and *c d* the "furrow side." From *a* to *b* limits the depth of the slice, usually seven inches; *a d* the breadth, usually ten inches. The vertical cut from *a* to *b* is made by what is called the "coulter," which is a species of knife attached to the "beam" of the plough. The horizontal cut *b c* is made by the "share," which goes under and cuts off, or rather partially tears and partially cuts off, the slice in the direction *b c*. The slice *a b c d* (fig. 1) thus cut off and separated from the land *e*, *g*, *g*, is take up by the end of the "mould-board," or "turn-furrow," and as the plough is dragged onwards the slice is passed over the varying curve of the mould-board, and made to assume a variety of positions, until finally deposited at a determinate angle. Fig. 2 illustrates a few of the positions which the furrow-slice, *a b*, *c d* (fig. 1), assumes. Let *a b*, *c d* (fig. 2) represent the slice as it originally lies; the next position is *d e*, *f g*; the final one *h i*, *k j*, the angle *i*, *j* being 45°. In this the final position, the complete inversion of the soil is illustrated. Thus the side *b c*, which originally is the upper, and covered with herbage in the case of "ley," or the weeds and roots in the case of "stubble" land, is the lowest when the slice is laid over in its final position, as *h i*, *j k*, the side *h k* corresponding to *b c*, *i j* to *d a*, and *h i* to *d c*. It is difficult to conceive of a more complete inversion of a slice, or rather the complete change of its position, so that the side originally exposed shall be covered; and one is constrained to admire the beautiful precision of the implement which effects this complete change. When a number of slices are thrown together they assume the position as shown by fig. 3, *a b* being the line of ground over which the plough sole has to travel. By drawing a line, *c d*, parallel to *a b*, a series of "shoulders"

FIG. 1.

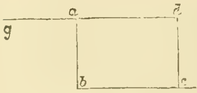


FIG. 2

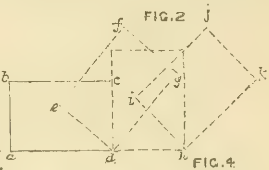


FIG. 3.

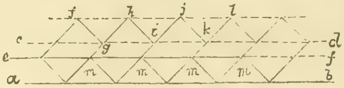


FIG. 4.

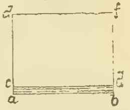


FIG. 5.

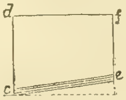


FIG. 6.

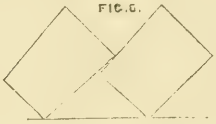
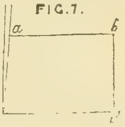
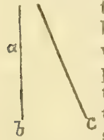
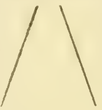


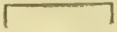
FIG. 7.

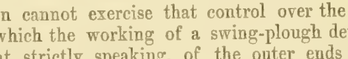


and depressions, as *e f g*, *h i j*, *j k l*, are shown. The angular depressions form the seed bed, the seed, as it is sown broadcast over the soil (if so sown) falling down the steep sides of the irregular shoulders, as *f g*, *g h*, into the lower parts of the hollows. By this means, after the harrow reduces and breaks down the apices, or upper part of the shoulders, as *f*, *h*, *j*, and *l*, the seed is deposited and the plants come up in regular and parallel lines. It is another of the beautiful peculiarities of the plough that, in laying the furrow-slices at determinate angles, as in fig. 3, the "shoulders" or angular projections, as at *g h i*, *i j k*, contain the greatest possible cubical contents, and expose the greatest possible surface to the action of the atmosphere. What ploughing is, is thus illustrated, and it may be defined as "the cutting of a succession of slices from the soil, and laying them over at a determinate angle, exposing the greatest extent of new surface to the action of the atmosphere, covering the old surface, and forming a number of parallel seed-beds or rows." In analyzing the construction of the usual forms of plough, the "swing" and the "wheel," the author offers some suggestive remarks, a few of which we shall briefly allude to. There is one point peculiarly observable, namely, the attention to minute matters of detail shown by our best implement-makers, and how important an influence these have on the working of the plough. Thus the writer draws attention to the placing of the stilts or handles of the plough as exercising an influence upon the working condition of the ploughman, fatiguing him or otherwise, according as they are placed; if too wide and too high at their extremities, much strength is lost, and considerable difficulty is experienced in guiding the plough. The swing plough is under consideration at present, which will account for these last words. The writer states his belief that the position for the handles or stilts is the best as shown in the rough diagram here annexed, the handle being at the extremity *b* some two inches inwards from the plane of the body of the plough, the distance between *b* and *c* being two feet. This arrangement is opposed to that adopted by some makers, who have the stilts or handles projecting from the body of the plough and forming equal angles, as thus:





This, however, is not so much an important point as making the termination at the outer ends of the handles too high from the level of the ground; for if too high it is obvious that the ploughman cannot exercise that control over the impleplement which the working of a swing-plough demands. The height, strictly speaking, of the outer ends of the handle depends or should depend upon the height or tallness of the man working it; this adjustment is, however, not capable of being very easily made in practice, hence a medium height has been decided upon for swing-ploughs, namely two feet ten inches, or from that to three feet. Another point to which the writer directs attention is the position of the beam at the end opposite to the stilts; the best position for this being not in a line with the plane of the body, but bent in towards the furrow side of the plough, as in the diagram, which is purposely exaggerated in outline, the distance of the end *a* of beam *a b* from line *c d* of plane of body *b d* being 1¼ inches. In the construction of swing-ploughs the land side of the body of the plough, as *b d* in the above diagram, or that side which presses against the uncut soil, or soil rather in process of being cut, is generally made flat; in practice, however, it is sometimes found that this form increases the draught of the plough, which has been found to be obviated by making it slightly concave, the greatest depth of concavity being at the centre of the body. So much for the body, the beam, and the handles of the plough, which may defined as the bearing parts of it. In discussing the active parts—as the share, the coulter, and the mould-board—the writer goes very fully into their details of construction and mode of operation; for those *in extenso* we must refer to the paper itself: all we can do within the limited space at our disposal is, to glance briefly at the leading points connected with them. We have said that the form of the furrow-slice in its normal condition is a rectangle, as shown in figure 1, the opposite sides of which are equal, and that one result of this shape is, that when a number of slices are laid over at an angle of 45 degrees the shoulders are all of equal height, cubical contents, and superficial area; but as we proceed we shall see how this form and these circumstances of ultimate condition are much modified by the active parts of the plough now to be considered, namely, the share or sock, the coulter, and the mould-board. And first, as to the share or sock, the office of which is to cut the slice horizontally from the ground; this is not in the ordinary plough spud-shaped, like the sock of the turn-wrest plough hereafter to be noticed: that is, it does not present its cutting edge at right angles to the line of draught, thus:  but is placed at an angle thus: This has an important influence upon the cutting action of the sock; for in place of forcing portions of the soil and obstructions, as stones, &c., before it, if shaped like the first of these diagrams, these slide past, so to speak, at the side of the sock, the sloping side favouring this. The sock does not completely sever the slice horizontally from the adjacent soil, but leaves a portion uncut to be forced or torn away by the forward action of the mould-board. The office of the coulter is to cut or sever the slice vertically; and simple as this member appears and its mode of adjustment, there has nevertheless been much discussion as to the best position which it should assume in the plough, this having special reference to the position of the point above the share, and to one side of it, and also in its relation to the land-side of the plough, the writer being of opinion that it is bad practice to have the point of the coulter much above the surface of the share, thus forming a space into which the soil can be forced, and thus bring about a disturbing influence upon the action of the plough; still more decided is his opinion that it is bad practice to place the point of the coulter in advance of the share. Some ploughmen, in order to give a clear and smooth edge to the furrow-slice, set or temper the coulter so that its side does not lie in a line with the plane of the body, but is twisted in towards the land side; this, in the opinion of the writer, tends to increase the draught of the plough. It may have been observed by the reader, in examining various forms of ploughs, that the coulter is set at various rakes and at various angles with the line of the sole of the plough; some advocate a very sweeping rake or a low angle, while others advocate a less rake or a higher angle. It would be reasonable to suppose that the angle of the coulter would exercise some influence upon the draught of the plough, and that there would be one particular angle at which the draught would be reduced to a minimum. But experiments on an equal soil seem to prove that the angle or set of the coulter exercises very little influence upon the draught, either in the way of increase or decrease. This, however, holds good, we suspect, only in soils of an even and clean character, but the case is and must be different where stubble or otherwise foul land is being ploughed; the higher the angle or more



nearly approaching the vertical at which the coulter is placed, the more resistance will be given to the forward progress of the plough, and this not because it acts upon the soil in a way to retard it, but rather this position of the coulter tends to encourage, so to say, the collection and retention of the weeds, in place of throwing them off as would be the case to an extent more or less easy if the coulter were placed with a low angle; indeed, in practice it has been found that as much as one-half of the effective traction power has been lost through the accumulation of weeds upon the coulter, &c., in foul land. The chief influences at work determining the forms of the furrow-slice are brought into existence through the action of the members we have just described, the share and the coulter. The influence in this direction of the next member, the mould-board, is less marked: not that its shape has no influence upon the form of the furrow-slice, but it is not so strongly operative as to destroy or get rid of the work of the share and the coulter—this remains stamped, so to speak, upon the furrow-slice throughout, and at its first formation. One great influence the mould-board possesses is the consolidating the furrow-slice as it is turned over. By some the peculiarly curved surface of the mould-board, so familiar to us all, is thought to be essential to the turning over of the furrow-slice: those who believe so will be surprised to learn that it is not so essential; for a furrow-slice cut from the land by the share and the coulter can be turned over by a flat board; this is seen in the Kentish turn-wrest plough, in which there is no mould-board in the ordinary acceptation of the term, but a mere board, the surface of which is nearly flat, only slightly convex, but which has no swelling part, the surface being all in one plane. But the fine curves observable in our finished ploughs perform one office, which by some is considered to be very important, namely, pressing or consolidating the furrow-slice, and giving it that fine smooth appearance which is by them considered crack ploughing: others do not hold this opinion, but conceive that that result is not the one which it is desirable that a good cultivating implement should bring about; but this opens up a controversy which may hereafter be alluded to, as it bears upon a subject of much practical importance. But from what we have said, it must not be supposed that the form of the mould-board—that is, its section—and the ondition of its surface—that is, its shape in the direction of its length—is a matter of no moment: the reverse is the case, which may at once be understood from the fact that the inversion of the furrow-slice, which is the office that the mould-board has to perform, is produced by a uniform and continuous motion, which necessitates therefore an unvarying uniformity of surface—that is, a freedom from all protuberances. It is defined by our author as a twisted wedge, or rather a "body combining in its conformation the principles of the wedge and the screw." The author points out the importance of having, as an easy-going plough, a mould-board so made, that if a straight edge is laid along it from one end to another, it will lie flat; further, that although twisted on its surface, still measured at "any part in a direction at right angles to the line of draught, the line so measured will be straight on its surface." "Hence," he continues, "an accurate uniformity of surface is essential, so that the slice shall have an equal pressure given to it both lengthways and transversely, and that the form of slice as determined by the share and the coulter shall be maintained or preserved by it; and that in the words of the great authority of the agricultural world, "the furrow-slice shall lie, after being turned over, in a perfectly straight line, not only unbroken but uncrushed.' A short mould-board, with abrupt lines coming into a plane at right angles with the line of draught, must therefore show a greater resistance to the force of traction than where its lines are more coincident with the line of traction. A long mould-board with easy lines, tending in a line generally coincident with the line of draught, will therefore be an easy-going plough. But this easiness of draught does not alone decide the question of the best form of plough. Where the standard of ploughing we have just named is considered, the long mould-board will be considered the best: where a breaking of the furrow-slice as it is turned over is considered advisable, a mould-board more or less abrupt will be the best to use." Much has been written, with a view to decide the best form to be given to the mould-board; but the discussion of the points would take up too much space to be noticed here; so we can only refer to what the author has said upon it, passing on to note that those in use may be classed under one or other of two forms—the convex and the concave. The convex is formed so as to give a "high-crested," or "high-shouldered" form; what is meant by this term we shall presently see; the concave is a rectangular furrow-slice, such as in fig. 1. Let us glance briefly at the influence upon the form of the slice thus brought about by those forms of mould-board. As the mould-board of a plough passes from under the slice—or, to put it more familiarly, if not so correctly, as the furrow-slice passes along the surface of the mould-board, it makes or describes an imaginary line. If the height of the mouldboard was uniform throughout its length, this line would be parallel to the line of the sole; but the mould-board is not so uniform in height, but rises wedge-like as it approaches the handles of the plough: the line thus described by the lower edge of the furrow-slice towards the land side is varying in its outline. On the furrow-slice assuming the vertical position, the land-side edge is at the highest point on the surface of the mouldboard; and when the plough is well-constructed, this point is distant from the land side of the plough-body equal to the breadth of the furrow-slice. Concave mouldboards exercise the pressure upon the furrow-slice chiefly at the extreme upper edge, or rather corner formed by the end and side of the slice, so that little influence can be, and is, exerted by crushing or squeezing so as to change its shape; but in convex mouldboards the pressure exercised by them is continued down the side of the slice, so that there is a tendency to crush it, and cause it to bulge upwards, and form what is called a high-crested or high-shouldered furrow-slice. The chief agencies, however, in changing the form of the furrow-slice so as to form high-crested furrows are, as we have before stated, the share and the coulter. And first, as to the action of the share in this way, and which is explained by the author of the paper as follows: If we suppose the cutting-edge of the share to be parallel with the plane of the sole or base of the plough, as *a b* fig. 4, the surface of the soil being supposed to be parallel also, it is obvious that the slice so cut off will have a depth *c d* equal to *e f*, so that a rectangular slice *c d, f e* will be formed; and when a series of slices are turned over by the mouldboard, they will present the appearance as in fig. 3. But if the cutting-edge of the share be raised—in practice it is from 1 to 1¼ inches in height—then the slice it cuts off from the soil will be narrower at one end (*e f* fig. 5) than at the other (*c d*); and when a series of such slices are laid over by the mouldboard, they will no longer assume the appearance as in fig. 3, but that in fig. 6. By giving the coulter an inclination towards the land side, as shown in fig. 7, another form of furrow-slice is also obtained, which, when laid over, gives a high-crested slice. Much has been written as to the relative advantages of these two forms of furrow-slices, on which says the author, "We have little to say farther than this, that the general opinion of practical authority is in favour of the rectangular furrow-slice, while that of the theoretical is entirely in favour of it. For if the object aimed at in the formation of a furrow-slice be the getting of a form which gives the maximum of bulk of matter raised with a maximum of surface exposed to the weather, which we presume is the aim, then we do get it in the rectangular furrow-slice. But the action of the shares which gives this form of furrow-slice must not be overlooked. The sole or pan left by the rectangular furrow-slice is perfectly flat, while that left in the crested furrow-slice is in the form of steps. Acting as retainers of water, there can be no doubt of the disadvantage of these alternate hollows and elevations in the pan or sole of the ploughed land. On the other hand, these hollows are filled up sometimes by the soil which is moved off by the lower edge of the mouldboard. In either of these cases there is evidently so much less soil exposed to the action of the atmosphere." The high-crested furrow-slice is however in great favour with some, as it is supposed by them to give a much neater finish to the field when ploughed, especially in the case of ploughing lea. There are still several points of importance connected with ploughs, which we propose briefly to discuss in our next "Chip."

FIELD AND FERN.

(From *The Times.*)

[FIELD AND FERN; OR SCOTTISH FLOCKS AND HERDS. By H. H. DIXON, author of the Royal Agricultural Society of England Prize Essay on "Shorthorns, 1865." London; ROGERSON and TUXFORD, 246, Strand.]

At this festive season of the year—to borrow a favourite advertising exordium—the minds of the most ethereal among us must occasionally run on the subject of eating. The topic is forced upon us at every turn, whether we will or not. The shop-front of a butterman, which, with its bladders of lard and massive double Gloucesters, is not usually particularly attractive, is converted into a little Dilkoosha, or Garden of Delight, with a mimic lake in the centre, on which swans, manufactured of the best Dorset, are gracefully floating. The poulterer covers the whole front of his house from attic to basement with geese and turkeys; while the butcher, by means of gay ribands and rosettes, makes his prize joints look as picturesque as possible. In short, everybody is reminded that he has a stomach, and that it is his bounden duty to fill it if he can. Again, as we wandered among the stalls and pens of the Islington Cattle Show, and surveyed that unrivalled collection of domesticated quadrupeds, we were compelled to remember that all this display of animal perfection really meant sirloins of beef, haunches of mutton, and legs of pork. It is sad to think that over the majority of those symmetrical beings—at whose nurture Art and Nature have gone hand and hand—the Damocles knife of the blue-tunicked executioner hangs glittering, ready to fall within a day or two. But we do not suppose that many people indulge in these sentimental reflections. Perhaps they feel as the pretty young lady did who delighted her tender-hearted lover by compassionating the sufferings of the oxen under the merciless drovers' cudgels. "Only think," she said, by way of clinching her arguments, "how it bruises the beef!"

One thing, however, is certain. Either from the naturalist's or from the epicure's point of view, sheep, oxen, and swine are especial objects of interest to Londoners during the month of December; so we think we may, without fear of offence, ask our readers to join us in examining a book which treats of the flocks and herds of North Britain. We shall not be too technical for fear of becoming unreadable; in fact, we mean to review the book rather in the character of a cockney than of a grazier.

The author calls his present book *Field and Fern*, and has, we notice, published other books under similarly alliterative titles, such as *Post and Paddock*, and *Silk and Scarlet*. Probably this little etymological device tickles the palates of his rural readers, and, if so, he is quite at liberty to indulge in it. This, however, is but a trifling matter. It is more to the purpose to remark that Mr. Dixon writes with an extraordinary enthusiasm and earnestness concerning horses, oxen, sheep, pigs, and dogs — an enthusiasm which appears sometimes ludicrous to those who have little taste for such subjects, but which gives a remarkable vividness and reality to his descriptions; that he traces the pedigree of a greyhound with a loving devotion such as Sir Bernard Burke might bestow on the annals of a family of historic fame—in short, that he is much at home among famous hunters and racers, and prize bulls, and prize pigs, and prize fowls, as Mr. Frank Buckland is at home among giraffes, and porpoises, and boa constrictors.

Before crossing the Border the author had already spent four industrious years in inspecting the flocks and herds of England. His object in visiting Scotland is best told in his own words:—

> "I wished to visit past and present Highland Society winners, in their own stall or fold, and to gather evidence from those breeders who stand high in its annals, not only as to the present progress of the stock on which England depends for such extensive supplies, but also as to the thoughts and labours of men who have done Scotland good service, and then passed to their rest. Grouse shooting, deer-stalking, and salmon rod-fishing have their own liege lords of the pen; but still there were many little points connected with hunting, coursing, racing, and otter-hunting which seemed calculated to work into a picture of Scottish life, and to vary the monotony of mere beef and mutton chapters."

He soon found that he had set himself a serious task. He had to pluck the heart out of three summers, a winter, and a spring, to travel some 8,000 miles, to sleep away from home 250 nights, and change his bed 146 times before he wrote a line. As for the manner of travelling, he tells us that he tried walking, but found it unsuitable for the responsible task which he had in hand. Coaches and railways afforded some help; but after a day under a heavy knapsack he was too tired to undertake the inevitable evening cross-examination on the all-important subject of stock. Accordingly he pushed his way to the Orkneys, and there bought a "garron"—a shy half-bred island mare—and on this northern damsel's back performed the rest of his preregrinations, riding her ultimately up to his own door in Kensington-square. In these locomotive days, when we can scarcely accomplish the simplest journey without seating ourselves in the body of a great black caterpillar, hundreds of feet long, with fiery eyes and tail, there is something delightful in the sensation of being dependent only on so small and manageable a creature as a horse. But this mode of travelling has its drawbacks. It is a weary thing to sit at night for three-quarters of an hour on a corn-box in order to make sure that the ostler does you justice. Then the Highland ferries were a constant source of difficulty; the Orkney lass bolted whenever she saw a railway train, and the author thought himself lucky when he could put her head in the right direction, so as to get a three hundred yard gallop to the good. In Lanarkshire and Ayrshire he sometimes found a blast furnace roaring like a lion in the path, late at night, between himself and his inn. The only plan of action to be adopted with the "garron" in this case was to blindfold her, stuff her ears, and twist her round five or six times, just as we twist Buff round at a children's party. "Still, with fine weather," he says, "it is a grand independent way of travelling. It was positively exhilarating to put the mare's head straight across Scotland during a hard frost, from St. Boswell's to Ayr, or to rattle from Athelstaneford to Kelso over the Lammermoors with two shirts and three pairs of stockings on, with the thermometer at 16 below freezing point, and the cold cutting your cheeks to the bone."

Having said so much concerning the mode of travelling, let us accompany the author on some of his excursions. We intend to dwell very briefly on the main topics of the book, which comprise a general sketch of Scottish farming from a prize-stock point of view. Practical men will of their own accord search the pages of *Field and Fern* for this information—we prefer rather to choose such items of intelligence as will interest the general reader.

Our first visit shall be to the Shetland Islands, in the month of August. Lerwick is described as a quaint, old, innless town, with one narrow flagged street at the foot of a hill, up which the wayfarer climbs through alleys bearing the proud names of Pitt and Reform. Wherever there is a sporting picture to be seen, either in a shop window, a private house, or a tavern, Mr. Dixon is sure to take note of it. He remarks with satisfaction that the Lerwickers possessed photographs of Earl Zetland holding a grey horse, but adds, with the melancholy air of a missionary in a heathen land,—"Job Marson and Voltigeur are names unknown." Taking a walk into the country we find that the Shetland Islands still retain a good deal of primitive simplicity. There are neither public-houses nor milestones, but the rites of hospitality are well understood. The humblest people will provide eggs, oatcake, and buttermilk, and a trifle in the baby's hand at parting will send you away with a blessing. And, except when the Channel Fleet comes, and raises the price of everything, provisions are cheap. A goose may be bought for 1s. 6d., a good fat hen for 6d., a ewe for 7s.; indeed, for £60 one could stock a miniature farm, and have a team of four mare ponies. The sound of these words is tempting to a dweller among bricks and mortar, but we must not forget the long dark winter, and the angry sea which separates the Shetlands from Great Britain. Looking with the eye of a fastidious Southerner at the wild diminutive sheep and cattle, Mr. Dixon breaks out into a strain of humorous lamentation—

> "Why had we ever loved a shorthorn and nursed our love at Towneley and Athelstaneford? What had we done that we were paying this fearful penance by walking '18 miles on end' to an unknown Voe or a remorseless Pa-Pa? Shall we ever again join in those merry sales at Blenkiron's, and the annual call for Dundee? Why had we given up our herd rambles to English farm-houses, peeping out coyly among bee-hives and apple-blossoms, and redolent of fat bullocks and wedders, to roam in these ancient silences with three-year-old mutton at 4 lb. a quarter?"

We are surprised to learn that Unst, which is, we believe, the most northerly nook of Her Majesty's dominions, may be regarded as the heart of Shetland, and that in the late northern spring, when other parts of the country are dismal enough, it is a sunny, genial-looking spot. Passing by an interesting account of the Shetland ponies, let us next glance at the Orkneys.

Mr. Dixon gives the Orcadians a high character. No oath, blow, or drunkenness, he declares, has ever been known at Shapinsey revels, which consist of Highland games, sack races, and rifle shooting. The islanders are of a highly studious turn, very fond of astronomy, and have torn *Alison's History of Europe* all to tatters. This island of Shapinsey, which belongs to a single proprietor, Mr. Balfour, may be selected as a favourable specimen of Orcadian progress, the breadth of land under the plough having increased from 700 acres in 1848 to 6,000 acres in 1863. Shapinsey is six miles long and three miles broad, but, though so small, may fairly compete with the mighty continent of America in claiming Washington Irving as a son of the soil; for though he was born six months after his parents had quitted the island, his ancestors had lived there for many generations. But we must not venture in this article to talk about famous men, unless, indeed, they are famous as sportsmen or breeders of stock. Let us rather remark on the improvements in the Shapinsey stock. The cattle are crossed with shorthorn bulls, the pigs with the Buccleuch breed, and the garrons with Clydesdales, whose fifteen two and three descendants are gradually supplanting the pony teams. Mr. Balfour extirpated the aboriginal breed of sheep as utterly worthless, and supplied their places with Leicester-Cheviots. Touching horsebreeding, we read that when the Orcadian garrons *were* garrons, the colt used to live under the cottar's roof, but that this Arab-like feeling has died out, while mongrels from Caithness have ruined the old-fashioned stamp, so that farmers are now compelled to cross with Clydesdales, or whatever they can get. The author evinces much glee at meeting in this out-of-the-way corner of the world one Dick Smith, a Devonshire man, full of Devonshire hunting stories, but now first whip and kennel huntsman to the Fortescue harriers. Their kennel is near the sea, and during foggy weather the deep toll of their voices has several times prevented a ship from running ashore. The Trinity Board really ought to subsidise this pack.

Caithness is a stirring agricultural county, considering its high latitude, and its "three climates a day," but it is well stocked with spirited planters and breeders, men who don't know what "impossible" means, who have clothed naked hill-sides with luxuriant plantations, who have spared no expense in importing good blood, and who combat the rigour of their climate with generous feeding and careful tending. The author gives us a graphic sketch of a night spent on his skittish mare's back in the midst of a dreary Caithness moor during a tempest of rain. He was so tired out that for a couple of hours he slept on her back, and awoke much refreshed. Speaking of this, or some similar night, he reminds us that there are pleasanter moments in a man's life than those passed in rubbing down a mare, very short of condition, in a cow-house on a wild moor at midnight, by the light of a dim spluttering dip, with the wind sighing through the broken panes, the heavy rain drops pattering on the door sill, and a 40 miles ride in prospect. A little further on he gravely moralizes on the fate of two foxes, killed in no fair chase, but stuffed with straw, and creaking like felons on a gibbet in front of a shooting lodge. "No Oulton Lowe or Cream Gorse for them," he emphatically exclaims; "no cheery view-halloo from Jem Hills or John Walker!" But while commiserating the ignoble end of these luckless reynards he is compelled to admit that there was no help for a deed apparently so dastardly; the cubs can't be dug out of the rocks, and the old ones make havoc among the lambs and hares until they grow too fat to trot. Here is an anecdote for invalids who complain of the damp of our climate, forgetful that to this perpetual moisture our Englishwomen owe their long-lived charms:—A patriarch past 80 years was begged to keep warm in his cabin during his last sickness. He replied, "It's keeping fra the wet that makes me ill." Sturdy men, indeed, they are on this north-eastern coast, doing everything in earnest. Even the minister of one of the churches had worn a hole through the floor of his pulpit from the perpetual Sunday emphasis of his right foot. A few sensible words on Highland emigration are worth citing here:—

> "Along the hill-side to the right are the cottages with their plots of ground, which were allotted to those Highlanders who would not emigrate when they were ordered to quit the glens. It was, doubtless, a sharp sermon, and rendered doubly so by the stern opposition; but even the traditions of 'hame' will, as years go on, melt before the conviction that chronic snuffing and shin-toasting, and rearing a few potatoes within a tumble-down wall, are not the mission of a Highlander. They were taken from that useless existence to a spot where they have full exercise for their energies both by sea and land. It was a readjustment very bitter to the Highland heart, but still wholesome and right, as sheep were placed where there ought to be sheep, and men where there ought to be men."

We need not stay long in Ross-shire, the cultivated part of which is a mere fringe of the moors, the other nine-tenths of the county being given up to grouse, sheep, deer, and crofters. The crofters on the west coast live chiefly by fishing. If they come east in search of fortune they make good workmen, and are content, like the rest of the labourers, with their cup of coffee, but their Gaelic tongue is sadly against them. The crofters on the east coast are a superior race of people, who have picked up the Saxon speech. They generally keep a pig, not for home consumption, but for sale, pork being throughout Scotland an object of aversion to the poorer classes. In the matter of flesh meat they are generally dependent on a bit of home-reared mutton. These pets seem to wander over the unfenced crops as they please, and eat out of the pot as well. Their wool supplies the gudewife's spinning-wheel all the winter, and two or three of them, a pair of Highland ponies, a stirk or two, and a dozen hens, make up the live stock of one of these five-acre holdings. Here we must pause for a little bit of meditation. Which is really the best off, a humble crofter, to whom gold coins are almost unknown objects, or a town artisan with his 35s. to 45s. weekly wages? We are inclined to think that the former is the happier fellow of the two. The town workman pays dearly for his high wages and intellectual advantages in costly lodgings, confined air, and want of play-room for his children. But the irresistible tendency of modern life—until men have grown rich—is to shun the country and flock to the town; so we had better say no more on the subject.

Our readers must not fancy that a true notion of the contents of Mr. Dixon's book is afforded by the extracts hitherto given. These are only the pleasant bypaths in a grand prose epic, which is chiefly devoted to the glorification of sheep and cattle. When he turns into these sidings—apparently for the benefit of benighted beings to whom shorthorn idolatry is but the shadow of a name—the author is pleasant and instructive; but when he is driving on the main line of Bullockry, he rises with the majesty of the subject, as Lord Macaulay rises when William of Orange is on the scene, or as Mr. Froude rises when telling of the siege of Edinburgh Castle. Here are some of his remarks on the character of a departed stock-breeder: — "The history of the late Mr. Grant Duff's mind on shorthorn breeding may be read through the notes of his annual catalogues. Some breeders keep them bound up, and take to them for light reading on a winter's evening. In point of candour he was a perfect Mechi, and showed all the ardour of an old missal-hunter in routing among old herds. He quite rises into prophecy in some of his foot-notes, when he utters a warning voice against over-feeding for shows, disregard of pedigree, and careless crossing. A cross-bred bull was his aversion. He fully allowed that 'a good beast was a good beast, however come,' but adds most wisely, 'We cannot depend upon succession without pedigrees.' When he abandoned his prejudice against stock by Lord Kintore's bull, it was 'the stock of old Rose that compelled me;' and when he began to wean his calves on oilcake, he only did it in deference to contrary opinions.'" Why do we feel inclined to smile at the grave enthusiasm of this *éloge?* If that man is a benefactor who makes two blades of grass grow where one grew before, he must be a still greater benefactor who multiplies the number of bullocks and magnifies their size. How many ambitious kings, and famous statesmen, and busy churchmen, and bawling orators do as much real good to the world as these unobtrusive cattle-breeders? Yet we don't laugh over their funeral orations, simply because, in rehearsing their deeds, there is no need to mention oilcake or turnips.

Still more enthusiastic does Mr. Dixon become over the glories of the Sittyton herd, 13 miles from Aberdeen. Before visiting the herd he gets hold of a "59-page catalogue, with red edges, containing 216 females," and reads it up with the keenest relish, just as a connoisseur of the Old English School the evening before the sale at Christie's gloats over *his* catalogue, and calls up mental visions of Cromes and Paul Sandbys and Girtins. We won't inflict the whole of the Sittyton herd on our readers, though to a breeder the history is highly fascinating, nor will we narrate how Messrs. Amos and Anthony Cruickshank "gradually built it up from a cow in-calf, called Durham Countess." Of famous prize cattle, Mr. Dixon always speaks in terms of affectionate respect. Here is the story of a certain bull named "Forth," who went south to the cattle-show: "He was terribly sea-sick both ways on his journey from Aberdeen to Newcastle (to which he got a 15s. return-ticket), and yet his eye was as bright and his handling as firm as ever after a Sunday's rest in the show-yard. In short, there never was such a philosophic 'fat boy in *Pickwick*.'" Further on we read that "Lord Raglan came roaring in the old style round the corner, and kept Amos and his white crush-hat almost on the run." Mr. Dixon's style is elliptical, and sometimes we scarcely know whether his names apply to a horse, a bull, a greyhound, or a human being. We presume that the above-named Lord Raglan was a horned quadruped, and not a military biped. Again, we read several times of Sir Walter Scott, and believe him to be a bull, and not a novelist, though when we learn that he and sundry other celebrities "are engaged in carrying out the great object which their owners have held to so steadily for nearly thirty years—flesh production for the people at large—" we feel that the Scottish bull must be a reasoning being, with a large lump of benevolence between his horns, and an especial sympathy for roast-beef eaters.

We must spare a few lines for John Benzies, captain of Mr. McCombie's training depôt at Bridge-end. John is a perfect almanac on the subject of fat shows, which seem to act as milestones on his journey of life. He is decorated with medals both British and foreign, has thrice crossed the Channel, leaving six bullocks behind him, and bringing back £370, besides cups and other honours. "It was here," says Mr. Dixon, speaking reverentially, as of a departed saint, "that the great Poissy bullock was fed, and John waxed eloquent at the remembrance of him, although neither he nor his master have heard his weight to this hour." There is something inimitably pathetic in this last touch. You are parted from a dearly-beloved friend, probably for ever in this world, and you still cherish his memory, although, with inconsiderate forgetfulness, he has neglected to tell you how many stone he makes in the scales. As for the great prize ox of '63, Mr. McCombie observes that a little man would not be able to see him without assistance, and then enthusiastic Mr. Dixon climbs the manger and surveys the vast plateau of roast beef! "Have you ever looked over more pounds?" was the triumphant query.

In his own line the author of *Field and Fern* is a master of quaint and forcible language. Speaking of some plough oxen that were being fattened, he says, "Flesh has too often a tendency to run to tallow after these furrow gymnastics." "The bloodiest black about the place" sounds coarse, but it only means the black bullock with the best blood in his veins. This animal had declined to profit by any amount of anti-Banting treatment. "His stomach," we read,—

> "Refused its office; the tape only told of 8 feet 5 inches, and there he stuck month after month. His great beauty melted his owner, or he would have sent him in to 'some side-show.' In the spring he took a start, reached 9 feet 3 inches, and finally won the head prize both at Birmingham and at Islington. On the journey he lost very little; in fact, it is only the half-trained beasts that go to pieces then; but his appetite failed sadly, and all the fire was out of him when he had gone through the Birmingham ordeal, although he was so wild at home that he required six beasts and four men to coax him to the station."

After this biography of "the bloodiest black about the place," town-bred readers may look with a keener interest on the men who have charge of these mighty yet sensitive creatures, and may also remember that the tranquil-looking beasts which they see at Islington have often been tamed into an unnatural quietude by the toils of travelling.

Let us now take a long leap from Aberdeenshire to the English border, and pay a visit to Dr. Grant, a famous sportsman of Hawick. He is a Highland-man; but greyhounds, terriers, otters, and a good practice tie him to the district. His house is a faithful reflex of himself. A stuffed badger on the stairs, a 25lb. otter on the landing, and a colony of mats made out of puppy skins. You wipe your feet at the bottom of the stairs on all that is mortal of the black-and-tan Merryman, in life a mighty hunter of water rats. Only two dogs are allowed bed and board in the house. These are Bobby and Billy, who, after a hard day's work, dress each other's wounds most devotedly. They share the doctor's bed, and he takes his rest with these martial retainers at his back and legs.

Regarding the breeding and education of his dogs, the doctor believes "in no other blood than that which is derived from James Davidson, of Hindley, and almost primeval Pepper and Mustard renown." We are a little puzzled by this word "primeval." Even when used by geologists and palæontologists it is often a doubtful word, but what amount of antiquity does it imply in the mouth of a sporting *litterateur?* Are we to suppose that Pepper and Mustard flourished when Nimrod hunted the virgin world, fresh and green after the flood-waters? or must we bring them down to so ignobly modern a date as the Norman Conquest? We won't pause for a reply, but proceed to speak of the education of Dr. Grant's dogs:

> "They were entered with rats, and mounted the scale to cats as age and performance might warrant. Too many of the puppies stopped there, or got no further than a muzzled fox; but if age gave them solid confidence, they took their B.A. degree with the badger. This species of culture tends upwards to the otter, in which Tom and Teddy (the sons of Shamrock and Nettle) have become quite Regius Professors."

The reader will observe the delicate gradations—rat, cat, muzzled fox, badger, otter. How few of us, in the battle of life, by the way, get beyond the muzzled fox! The career of these puppies resembles the education of a mercenary beauty. In her pinafore days she flirts with small boys whom she meets at the dancing school. As she gets well into her teens she shoots her arrows at younger sons and Government clerks. Arrived at the full blaze of beauty, she tackles her otter—in other words, the banker, the rising M.P., the risen Q.C., or the broad-acred squire. However, the object of the young lady's pursuit does not treat her so rudely as the otter treats unlucky Teddy. We learn that he goes quietly up to the "fish-slicer"—a cant term for the salmon's deadly foe—and gets almost bitten to death without a murmur.

Mr. Dixon invariably fixes the date of past events by sporting landmarks. Let us take an example from a biographical sketch of Will Williamson, a retired huntsman of 82. He does not trouble himself with such trivialities as the battle of Austerlitz or Trafalgar, or say a word about Pitt or Fox; no, the occurrence to which he desires to attach a chronological significance took place "when Hambletonian and Diamond were all the talk;" and in one of his hero's rambles on Newmarket-heath he saw—not his Majesty, or the Prince of Wales, or Mr. Sheridan, or Lord Eldon; no, a far grander and more inspiriting sight—*he saw Sam Chifney and Will Edwards ride their maiden race as feather-weights together.* A fast friendship sprang up between the son of the famous jockey and the Scottish stranger, and the former sealed it at parting with a pair of braces, "the buckles of which have done duty on generation after generation of straps to this hour." The Scottish stranger reciprocated in later years with a suit of Scottish tweed. Talk of the decline of hero-worship! It exists in full swing, only instead of reverencing the bones of saints we idolize the buckles of jockeys. Only the other day, when Grimshaw was killed, the grooms and helpers in a certain inn stable solemnly assembled at dead of night with candles in their hands to do honour to the corpse of the departed worthy as it passed through the town. To how many famous lawyers, clergymen, physicians, merchants, or manufacturers would such a spontaneous tribute of affection be offered? When manhood suffrage becomes the law of the land, the House of Commons will not be filled, as some fondly anticipate, with philosophical radicals or fiery demagogues, but with celebrated sporting men. No future leader of the Commons need delicately call the attention of the House to the "Isthmian games" at Whitsuntide; the House will assemble as one man on Epsom Downs. In presence of the Jockey Club the Carlton and Reform will sink into insignificance, the Master of the Horse will become a more important functionary than the First Lord of the Treasury, and Admiral Rous will be Chancellor of the Exchequer. A candidate for election will be questioned on his capacity for taking water-jumps and on his proficiency in pigeon shooting; the statues of Jenner and Havelock will be replaced by effigies of Assheton Smith and Osbaldeston; while the mutilated Royal figure in Leicester-square will be discarded for a herculean presentment of the classic struggle between Sayers and Heenan. "Welshing" will be reckoned the most heinous crime in the calendar, and, as John Morrissey will probably at that time be President of the United States, we may hope for such an *entente cordiale* between the two nations as the Atlantic cable will never effect.

We must devote a word to Mr. Campbell, of Dalgig because of his singular dog-nomenclature. He appears to have invented a special language for the purpose—a cross between the Mexican and the Australian aboriginal tongues, and as musical as either. Here are some specimens—Canaradzo, Coodereena, Ciologa, Calabaroono, and Cadazooro. Some of his coursing friends have dared to infringe Mr. Campbell's patent, and one of them named a dog Dalgigaradzo. On all these musically-named creatures Mr. Dixon waxes earnestly eloquent. Of one, we read: "In the slips, she looked one network of veins; and all her litters have inherited her beautiful skin." Of another, we learn that "she was seized with dropsy, and became such a swollen object that she was within an ace of being put away" (an euphenism for "put to death") "like her brother. Mr. Campbell cured her with warm baths and flannel bandages. Ranter, by Bedlamite, was her first love; but the puppies came at a bad season of the year, and were wrong in their legs as well." Dogs, as well as men, are sometimes over-estimated. "Brighton," we read, "was sold at London for fitfy guineas, and went thence to Amesbury; but he was no good at the stud, as he got his puppies far too fine, and he became a parlour-dog at last." We can conceive the pathetic earnestness with which Mr. Dixon would pronounce these last words, conveying as they do a solemn warning to all future puppies. A parlour dog! What degradation it implies! Yet among bipeds there are a good many parlour dogs about, and they seem to take to the life very kindly. May not a poor man who marries a rich woman, and lives snugly on her money, be regarded as a sort of parlour dog?

We have left numberless good things untouched, but must wind up with a sketch of the character and later history of Charles XII. We are not speaking of the monarch who "left the name at which the world grew pale," but of a famous racer. Mr. Dixon finds a picture of him, by the elder Herring, at a country house. He has a keen eye for a sporting portrait, and goes on to say:—

> "The ears of the mighty Charles are screwed back, as if he would like right well to have a nip at somebody. Amid all his reverses, when his back had become quite hollow, and his tail was cut, he retained some faded notions of royalty, and he would not pass through Balby tollgates, the southern portal to the scene of his St. Leger and Cup victory against Lanercost, Beeswing, and Compensation, till both the gates were opened. When he got there, Tom Dawson, who had trained him when he left John Scott's, did not know him in the sale ring; and although he was the sire of some capital hunters, no one would venture on him at 'a pony.' He went to Ireland after that, and was eventually put down at Sheffield, when quite a shadow of his old self, and a carving knife and fork were made from his cannon-bones."

In his own peculiar line Mr. Dixon is decidedly an original genius. Though his pages bristle with technical terms, he is quite free from the vulgar flippancy and forced fun of the ruck of sporting scribblers; he writes like a man of cultivation and reflection, and he is far too much in earnest to indulge in any unseemly jocularity. It would be absurd to recommend these volumes to ordinary circulating-library readers, because, though they could scarcely turn a page without finding something interesting, they would be repelled by the elaborate pedigrees of bulls, rams, and dogs which occupy a large portion of the book; but for sportsmen and breeders we judge that *Field and Fern* affords a valuable and entertaining compendium of information. As the author tells us in his preface that he is preparing a similar work on English Flocks and Herds, we venture to advise him to be more explanatory and less elliptical than he is in these volumes, so that non-sporting readers—by whom he deserves to be known—may better appreciate him. We will give a single instance of his elliptical mode of expression. He speaks of "wandering off to Lochiel and Lochaber to see if the Cheviot is holding his ground after the Siberian 'sixty." We feel sure this would puzzle most readers, nor would the context help them. Mr. Dixon means that he was anxious to learn whether the very severe winter of 1860 had killed off all the Cheviot sheep in that district. This fault is partly owing to the terseness with which Mr. Dixon writes. He is the Tacitus of sporting literature. Terseness is a fault of which we have seldom to complain. Authors in general might justly hang the gold-beater's arm and hammer over their doors, for they almost always use more words than are needful for the reader's patience or their own popularity. And, as this remark contains a hint for ourselves, we will wish the author of *Field and Fern* a friendly farewell.

FARMING IN NEW ZEALAND.

Sir,—I have often heard from friends in England of the great difficulty experienced by farmers in obtaining farms, of the enormous rents which tenants are willing to pay, of the tyranny of some landlords, the vexatious damages done to crops by the over-preservation of game, and the large amount of capital which a farmer has to employ to ensure anything like substantial success in his business; and the more I hear of these things, the more I wonder how it is that men who are willing to risk so much for the chance of obtaining a livelihood are not more anxious than they appear to be to seek other fields of labour where their capital and enterprise are sure to find remunerative employment. I take it that one of the chief reasons for this is that the farmer is essentially a domestic sort of animal, not at all partial to change or excitement, and a stern believer in the very questionable wisdom of that proverb which informs us that "a rolling stone gathers no moss," never asking whether so far as experience goes the stationary stones in agricultural districts gather much either. Then, again, there is a difficulty in obtaining anything like reliable information respecting those places where an Englishman desirous of emigrating would naturally turn his thoughts to—the British Colonies. He is far too "canny" to give much credence to the reports of emigration agents, and looks with suspicion at the very disinterested advice contained in those little pamphlets, which the owners of emigrant ships get up and distribute, giving glowing accounts of "Goshens," "Britains of the South," and "El Dorados," where a man can sit under the shadow of his own vine and fig-tree, &c., &c., and to which they will be happy to convey you by their splendid line of A 1. clipper ships. Unless a man has friends in the colonies upon whom he can place reliance, his chances for obtaining truthful information are very few; and even then, if through misfortune, or, what is oftener the case, their own extravagance and folly, these friends are not tolerably well to do, he is very likely to get the other extreme of that picture which the emigration gentlemen paint, and to find the same place called Elysium by the one and Tophet by the other. With a view of giving, so far as I am able, an account of farming and farmers' prospects in the colony which I have made my home, I commenced this paper. My ability to explain what I know in grammatical and comprehensible English may be questioned; but my veracity cannot be impugned, for this is written from no other motive than to give those, who may be disposed to read, some little information about matters on which they may be anxious to be informed.

The colony which I have chosen as my home is New Zealand, and of a farmers' prospects in that place I shall write. Of course everybody knows that New Zealand consists of three islands called North, South, and Middle Island. The North is the scene of the Maoric war, and is at present in such an unsettled state, that it can hardly be recommended as a good field for emigration. The southern portion of the Middle Island has not been colonised so long as the North Island; but, on account of their large exports of wool and gold, the greater advantages which the land offers for profitable cultivation, and the absence of a large native population, they have already become more prosperous than their older neighbours—the province of Canterbury especially so; and as this happens to be the locality where my experience has been obtained, I will confine my remarks to that place.

The physical features of that part of the province which is available for agricultural purposes are anything but romantic, consisting as they do of one vast plain stretching north and south, a length of about 180 miles by about 40 wide, and covered thickly with long, brown, native grass on the dry land, and native flax on the wet, and dotted here-and-there with cabbage trees, sometimes in clusters, sometimes miles apart; and, as these seldom grow above 15 feet high, and look like a bare pole with a good-sized cabbage on the top, they do not add much to the beauty of the place. This plain is bounded on the one side by the sea, and on the other by a vast range of mountains, whose bases, thick with wild tangled forest, look like a great black fringe to the immeasurable fields of snow which hides their peaks for months together, and feed a thousand mountain-streams that rush down towards the plain, and, uniting as they go, form rapid and dangerous rivers, which during winter, when the snow accumulates for months without melting, are low and may be safely forded; but in summer, when the snow melts, are often so high, that it is impossible to cross them. A large portion of the plain is dry land, with a sandy subsoil; the remainder consists of rough, stony land, which will not pay for cultivation, and rich swamp easily drained, and when this is effected some of the best grass-growing land in the world. The climate is very changeable, often subject to droughts and high winds; but in a good season the weather is beautiful, the winter and autumn especially so, there being but very little ice ever seen here, and snow on the plains is a rarity indeed. In speaking of droughts I don't mean to compare them with the Australian droughts, for we are never three months without rain.

A farmer landing here with £500 in his pocket would find a choice of three things before him—to rent a cultivated farm in the neighbourhood of town, to purchase land from the Government, or to rent uncultivated land with the option of purchase in a given number of years. I will endeavour to explain each of these modes. A person renting a farm fenced, laid down to English grass, with house and sheds upon it, and within, say, ten miles of town, would have to pay from 20s. to 30s. an acre rent, and would rely upon sheep or a dairy for his income. Dairy produce always fetches a good price here, butter averaging about 1s. 9d. and cheese 1s. per lb. throughout the year. Fair dairy cows can be purchased at about £17 per head; and on a thoroughly good swamp farm a man could keep two cows to three acres. The mildness of the winter allowing the grass to keep fresh, no large provision of hay need be made for winter feed. Paddock-fed sheep do not pay so well here as they do in England, on account of the great numbers bred and fattened yearly on the runs. Mutton is seldom over 5d. per lb., and good cross-bred lambs at six months old fetch only about 15s. per head. The present price for merino ewes is about 14s., and for cross-breds from 18s. to 25s. Of course pure-bred imported sheep fetch higher prices, especially the Leicester, Romney Marsh, or Cotswolds. A good ram of either of these breeds would sell readily at from £25 to £35; but the cost of obtaining these in England, the freight, and the risk attending the voyage, would probably deter any man with small means from entering into this kind of speculation.

It very often happens that properties of the kind referred to above have been pretty well exhausted by over-cropping, and have not been sown down in grass till they would grow corn no longer, so that the feed is very poor, and its stock-bearing qualities not at all in proportion to its extent. A great many of the swamp farms have borne five or six crops following without the aid of manure, and their beggared state may be easily imagined. As soon as all the goodness is taken out of the land, its owner, having saved money, purchases land from the Government in a large block, and, if he cannot sell, lets his original section to the highest bidder. There are of course a great many cultivated farms to be rented, which are not racked out in this way, but they are in the minority. The renting of cultivated farms rarely pays much, and none but old people, or those who are not strong enough to stand rough work, should enter into this style of farming.

The next alternative is to purchase land direct from the Government, the price of which is £2 per acre, and may be selected in any locality, and purchased at the land sales which are held at the Government Buildings twice a week. All the agricultural land within 25 miles of town has passed into private hands; but the opening up of the country by means of railway is rendering thousands of acres of splendid country available for settlement. The land regulations of Canterbury are admitted on all sides to be the best and simplest in the Colony. The comparatively high price deters speculators and squatters from buying it up in large blocks, to the exclusion of the small farmer; but nothing, we know, is perfect; and here the great defect lies in the system of giving to run-holders a pre-emptive right over large tracts of splendid agricultural country for improvements which they for their own benefit, and of their own free-will, choose to make on their runs. If a person wishes to buy any part of this pre-emptive, he is obliged to give the run-holder notice, who has several weeks allowed him to purchase it in, and even then is not compelled to buy the whole acreage challenged, but by buying 20 acres can prevent you from buying 200; so that often enough large sums are kept out of the Treasury, and the settlement of the country retarded. The squatters were of course the earliest colonists here, and as a class are the richest and best-educated men in the place; and its success is in a great measure due to the capital which they imported, and the remunerative field for labour which their presence opened up. Squatters, and merchants with whom the squatters deal, and from whom the squatters borrow money on the security of their sheep and runs, have always been the dominant party in the Provincial Council; consequently, class legislation has been carried on to a very great extent, the Government of the day knowing too well the consequence of interfering with the interests or thwarting the ambition of the mutton lord and his agents, so the granting of pre-emptive still continues. Of course the encouragement thus held out to squatters to improve their runs has a beneficial effect on the import trade and the labour market, so that all are gainers to a certain extent.

Supposing the farmer to have purchased 100 acres of land, he gets from the Government a licence to occupy. Whilst his Crown grant is being prepared, he can commence operations at once. For a man with small means the dry land is best, because he need not incur any great outlay at first as in swamps, where a good deal of drainage is sometimes necessary before cultivation can be commenced; but on the plains the case is different: there is nothing to prevent you from commencing to plough at once, any more than there would be in breaking up an old pasture in England. Supposing the time of year to be August or September, which of course is our spring, the farmer having purchased a pair of horses (good ones can be obtained at about £35 each), a Hornsby plough (£13), dray and harness (£35), and a few bags of oats for feed (say, 50 bushels at 5s.), commences to break up his land. He can get a very fair two-roomed sod-house for about £40; stable for two horses, £15; and well, say £15. A pair of good horses will break up an acre a day, so that he can get 50 acres turned over, and perhaps a few acres down in oats, before the dry weather sets in, when the ground is too hard for ploughing. Then, if he cannot get work for his team to assist his neighbours with the harvest, he can give them a rest (they grow fat on the native grass), and he himself can find plenty of employment in tying corn at 10s. an acre, and after that in thrashing at 8s. per day, and probably a job for his horses now and then, carting grain to the mill. If a man happened to be able to afford to bring out a reaping machine (McCormick's are the favourites here, and cost from £70 to £80, if purchased here), he could get plenty of work, cutting corn at 10s. per acre, when himself, team, and man could earn from £4 to £5 a-day for very likely three weeks running. And, whilst on this matter, I would wish to say that a farmer coming out would do well to bring all his implements and harness with him. By the time the height of the thrashing was done, he would be able to commence cross-ploughing the land he broke up in the spring, and having purchased his seed-wheat, would get it all in by the beginning of June, when, in all probability, the ground would be damp enough to commence fencing. The fences are made of sods. A five-sod fence, with a ditch, six feet wide at the top, and about three feet deep, is the general thing; and this is planted with gorse, which, under favourable circumstances, grows into a splendid live fence in the course of three years. The usual shape of a 100-acre section is rectangular, having twenty-five chains frontage on a road, and running back forty chains. You usually have neighbours on three sides of you, who, of course, have to pay for half the fencing between you and them; so that, in order to enclose your one hundred acres, you would have to do about seventy-eight chains of fencing. A tolerably strong man, having once got into the way of it, can put up a chain of fencing in a day, the usual price being about 12s. per chain for a good fence. Having done so much fencing as he is able, by the middle of September say, he will get the remainder of his section broken up before harvest, which usually commences early in January.

This year he will find plenty of employment for himself and team in getting-in his own harvest, and will require the assistance of a man or two for, perhaps, a month. Good men can be had for about 25s. a-week, and found in everything. The only danger to crops here, after they arrive at maturity, is that, if they are left standing a moment too long, the chances are that the hot, strong winds which frequently blow at this time of the year would blow out a great deal of the grain. I have seen so much as ten or fifteen bushels an acre knocked out by this means. The crops on good new land usually average about thirty bushels an acre, and the price about 5s. 6d. per bushel, or say £8 an acre. For a man who had a reaping-machine of his own, and did most of his own work, the absolute outlay would be, for seed, 10s. an acre—£25; two men, one month each, say £18; cost of thrashing by steam thrashing machine, 9d. per bushel—£56; twenty gallons of beer, at 2s. 6d.—£2 10s.; total, £101 10s., leaving a balance of £300 for his labour, horse-labour, wear and tear, housekeeping expenses, &c., and for the purchase of seed-wheat and oats for the next year's crop.

It will be seen from the foregoing that a period of about eighteen months would elapse before the farmer would get any return from his land; but the money he would save from his funds when he arrived for housekeeping purposes, the gains of his labour during the first harvest-time, and the profits from the first crop, would be amply sufficient to supply all his wants for the first two and a-half years, when his second crop could be realized, and his income be regular from year to year. The second year he would have the whole of his land under crop—the new land in wheat, the stubble in oats, and, if he were wise, a few acres sown to English grass, in order to get sufficient seed to sow down a portion of his section with the third crop. Wheat sown after wheat has been, of late years, subject to blight; and it is not wise to run the risk of this. Oats generally do well after wheat, and *vice-versâ.*

A man with a small freehold of the size referred to above would, in the course of a few years, be in a position to stock his farm well, and to erect comfortable and substantial weather-board buildings; and if he had farmed his land well, and kept his fences in good repair, would be able to dispose of it at about £10 per acre. There is nothing to prevent a sober, industrious man, blessed with good health and ordinary good fortune, who commenced farming with £500, from being worth £1,200 in five years. I know dozens of instances of men who, five years ago, had not £100, being now worth far more than £1,200.

The third system of taking up land is carried out in this manner: A great deal of English capital is sent out here to agents and lawyers for investment; and the provincial newspapers are full of advertisements of money to be advanced for the purchase of land. One plan is to select Government land in any locality you choose, which the agent buys for you in the name of his client, and which you rent for five years, at 5s. an acre per annum, at the expiration of which term you have to purchase it at £5 an acre. Another plan is to pay 10s. an acre when you take the land up, and £2 10s. in seven years, with rent at the rate of 4s. an acre. The advantages of the purchasing-clause system are that it enables a man with small means and plenty of labour in his own family to enter into farming on a much larger scale than if he sunk part of his capital in the purchase of land; and, if he be wise in his selection, he will be able to save a great deal by the time the purchase-money is due; and the balance can be raised by mortgage, at ten per cent. interest. Two-thirds of the farms in the province are held in this way.

In making the foregoing remarks and calculations, I have taken it for granted that the emigrant is thoroughly sober and industrious, that he is prepared to work hard with his own hands, and is willing to exercise economy and prudence. Rash speculation and drink have ruined thousands out here. A man who is inclined to be lazy and wild will find a far better field for the exercise of his talents in England than here. Such fellows, landing here with a little money, generally hang about the town till they have spent it all, and then sink into billiard-markers, barmen, or cooks on stations; or, perhaps, some one, out of respect for his friends at home, takes him on his run as a "cadet," which means that you get all you can in the shape of work out of him for his food; and he is generally rather dear at that.

A man settling here with wife and family must make up his mind to find most of his pleasures in his own home; for there are no jovial market-meetings; no scampers across country after foxhounds or harriers; no afternoon wanderings with the old pointer amongst the stubbles, where the partridges go up with a "whirr," a good thirty yards before you, and the hare strides lazily away from beneath your feet: all these will be things of the past for you if you come here. There is not a brace of foxhounds in the place; and, as for partridges? well, there are a few in the Acclimatization Gardens; and a shot at one would probably cost you about £20 and the execrations of all good citizens. If you can be content to do without these things, you will have few of the cares and annoyances incidental to the English farmer, and so will lead a tolerably happy life. If, on the other hand, you are ambitious, and anxious to get rich, your success will be a gratification and a comfort to you.

A young man, newly-married, say with not sufficient capital to start farming in England, would find here a profitable field of labour, with the certainty of a modest competency in the course of ten or fifteen years. An elderly man, with lots of sons growing up about him, would find, in Canterbury, the labour of each worth £50 a-year; and, when they wanted to start in business for themselves, a few hundreds would give them a better chance for success here than thrice the sum would in England.

Of course, in a paper of this kind one cannot enter fully into details; but should this, so far as it goes, prove acceptable to your readers, you will in all probability hear from me again. In writing this, I have only been actuated by a desire to give information to a class in England from whom I am proud to say I sprung, so that they may know what colonial farming is like, and what a farmer's prospects are in this province, which is the best agricultural portion of New Zealand, and which exports more wool and corn than any other province in the colony. S. D. G.

Canterbury, New Zealand, Oct. 7th, 1866.

FARMING MATTERS IN SUFFOLK.

At the Lavenham Farmers' Club, Mr. W. Biddell said he hoped the Legislature would not only think of Reform, but also one that occupied a good deal of attention in his mind, though it was not just now brought prominently before the public. He hoped that present circumstances would lead them to reflect that it was hardly worth while aggravating the effects of a wet harvest by taxing a commodity which had been so largely injured. They had not studied the interests of the producer much of late, but he hoped they would look at those of the consumer, and not aggravate the pressure which this harvest was exercising upon the working classes by taxing the barley from whence *should* come their beer, though very often it did not come from it.

Major Parker, M.P., said with regard to the malt-tax, that the steps which had recently been taken rather led one to hope that the period was not far distant when that question would receive a solution more satisfactory than it had hitherto done. With the varied qualities of barley, though prices of the better kind were very remunerative, it was the inferior qualities that sorely pressed upon those who had not had the good fortune to harvest their crops in so good a condition as others. Leaving that question however, he would for a moment turn to another, on which he thought they might congratulate themselves and the country at large. The present year commenced under the most trying circumstances for agriculturists; they were threatened with many evils, some of which had pressed upon them with severity. He believed that in the first month of the year more than 10,000 of the cattle of England were dying every week, and in the month of February nearly 40,000 head of some of the most valuable stock in England was lost through the plague with which they were visited. What was the state of things now? He had received the last return, up to the 13th of the present month, and he found that during the previous week only one animal had died, and 11 had been killed to prevent the spread of the disease. He thought they might look upon the arrangements made with respect to this matter as among the most fortunate the country could have come to. The Legislature having enacted stringent rules, to which their countrymen had readily conformed, hardly a year had passed away before they found that one solitary death was all that was registered in a week, and the disease might therefore be said to have disappeared. About 100 years ago this country was visited by a like calamity. It was the natural feeling of human nature to desire to look out for one's self, and at that time he took it for granted that people did not conform to the rules and regulations prescribed, so readily as they had done in the case of this latter attack, for the calamity then remained twelve years amongst them; this time it had lasted but a little over twelve months. The difference, let them hope, was owing to a great improvement in the arrangements of the country, under the blessings of Providence. Another subject which troubled them beyond measure was the probability of the plague extending to sheep; but by the same return, to which he had already alluded, he found that although 6,000 had been lost by the disease, during the last week not a single case had occurred; so that all those stringent precautions which had pressed so severely upon their industry, their exertions, and their profits, had been amply rewarded by the passing away of those calamities.

Mr. GREENE, M.P. for Bury St. Edmund's, said if he took the liberty of speaking upon the subject of practical agriculture, he hoped they would consider he had some right to do so when he told them that he was himself a farmer of 600 acres of land. In the present day it required the utmost attention, the greatest vigilance, and the wisest possible way of laying out their capital, to make farming remunerative; but though he knew that it did not pay a large return, he believed it was to be made to pay, and that even yet farmers might live by their land; but it was only to be done by taking advantage of all the knowledge they could obtain. While they had to grow corn in competition with the whole world, it was quite true that they were at present receiving very remunerative prices; and he might say that once in every seven or eight years there was a turn of that kind that helped one over a bad year. They now had to compete with the world, and he thought there was a prospect of wheat keeping up in price; but they drew from so large a continent that it was impossible to say what the price might be a few weeks hence, and it would not do to farm upon the basis of high prices. How then were the moderate prices to be met? Though he had adopted, and was still adopting, one of the newest methods of cultivation, he did not look altogether to new-fangled notions for success; his idea was rather that of carrying out the practical knowledge a man has. First, he would say, "Grow no grass." There was nothing so expensive as growing grass on their arable land. They might rely also upon this—that they must make up for any deficiency in manure, and it would pay to use a portion of an artificial fertilizer in order that they might grow a full and proper crop, because there was very little more expense in harvesting five quarters of wheat per acre than three or four. He was quite aware that steam cultivation was not practicable in small fields, and from what he had seen in that neighbourhood he thought the fields were too small. He had seen both systems of cultivating the soil by steam. The one employing two engines was, he thought, the best; but, of course, the objection to it was the large outlay of capital it involved; but, still, he was of opinion that that was the principle for heavy land. He would tell them what he was able to do with his engine, adopting the system of ropes and porters. This year, treacherous a season as they had had, he had been able to cultivate and plough more than 100 acres of land, which he could not have done with horses. Having the power to do it quickly, he did it when the weather was dry. Calculating the interest upon capital, the wear and tear, and all the expense, he could cultivate cheaper by steam than he could by horses, and he had the advantage of being able to do it when other work was going on. There need be no fear that ordinary labourers were unable to do it. He assured them that when he adopted it he made no alteration in the labourers on his farm, excepting that he had a man to drive the engine, for they could not expect a labourer to do that. If he gave the order to his men to cultivate 40 acres of land, and went out for three or four days, when he returned he found it was done, as they did 10 acres a day. The way to do it was to put the work out to the men, and if they did that he would promise them that no time was lost in going from one field to another. He had had the honour of a visit from a deputation from the Royal Agricultural Society, to look at his steam cultivation, and they asked every question they could think of, and told him they had not been on to a farm (fortunately for him they had not then been to Mr. Kersey Cooper's, whom he considered the chief of steam cultivators) where so much cultivation was done per day. He believed that arose from his giving his men an interest in the work. They had heard a great deal of talk about the labouring man, but he contended that labour was a marketable article. They had got into a very different state of things to that which existed when the population was overburdened. The demand was now for labourers, and not for labour, and the man who had labour to sell could generally find a market for it. But he believed there was one thing of more importance than any other to a labouring man, and that was a proper cottage to live in. He said it was a burning shame that such wretched dwellings as they had in this county should be permitted to continue. It was true they might ask him how it was to be remedied, and it was a very difficult question, because the cottages hitherto had not been let upon a principle that would not pay interest upon the cost of its erection; but he was sure that with improved wages men would gladly pay more money for a good cottage, and he was sure that if they were to have good men in the agricultural districts they must have more accommodation. It was a matter of necessity that there should be at least three bedrooms in a cottage occupied by a family. Depend upon it this was one of the subjects that required watching on the part of those who desired to see the land fairly treated in Parliament; for it was not so much that there were Acts of Parliament to help them in a direct manner as to see that burdens were not improperly thrown upon land, as he believed they would if some people had their way. Therefore it had come to this—that they must look to themselves; for they were to compete with the foreigner, and he believed it could be done, but it could only be done by the exercise of determined perseverance and care. He knew it was said that any man would make a farmer, and that was to some extent true; but it was not every man that would make a good farmer. He never undertook anything that he did not do practically. He farmed because he was fond of it; but, although he did it on that ground, he made it his business to look into the minutiæ of it, and he could assure them there was no business that required more watching and good judgment, both with respect to the crops and the stock. It was to their stock that they must look; for what was a farmer unless a man was able to rear stock and breed sheep, so that he had not to go to the barn-doors for his rent? He very often saw gross mismanagement upon farms with regard to stock. He often saw young things brought up on a little skim-milk, and then turned out into a field, and at the end of twelve months they were about the same size, or perhaps a little smaller. Then he saw some of his friends go and buy a lot of ill-bred Irish bullocks. He learnt a very good practical lesson on this subject when he began farming. He bought a lot of bullocks, and though he gave them all they could eat he could not get them fat. It was, however, a cheap lesson in the end, for he never bought another lot like it. Then, again, if a man had a cow, he would send it to any wretched bull that happened to be in the neighbourhood; but, instead of this, they should desire to propagate a good breed of animal. Again, a farmer must have a horse to ride to market, or a mare to drive; and now and then he would breed from her, and for this purpose he would use any brute of a horse that came round, with neither action nor family to recommend him, and they availed themselves of him just because he passed their gate. He wanted them to remember that a good horse eats no more corn than a bad one. A good stable of horses ought to cost them no money: indeed, a farmer who hunted ought to make a hundred pounds a-year of his horses; and he might tell them that he had himself, in his younger days, had many a stable of horses that never cost him 2d. Mr. Biddell had touched upon a subject which it would not do for him to dilate upon—the subject of Reform. He was one of those who heartily desired to see that question settled; but he did not agree with those men who induced the working-man to think that some great boon was to come to him in the possession of the franchise, and that when the Reform Bill is passed he need not go to work any more. They might depend upon it there was no royal road to success in anything. Without industry, perseverance, and uprightness of character, it was impossible to succeed; and when he saw men (he did not say whether they were right or wrong) endeavouring to instil such notions into the minds of the people, he said they were not lovers of their country nor did they desire its welfare. To all those who talked in this way he should like to put one simple question. If there was a law that stood between a man and his success in life, he would be among the first to work, morning, noon, and night, to get it repealed; but he challenged any man to say there was such a law. If any gentleman differed from him he asked what there was that prevented a man from going to work and raising himself to the highest position a man could attain to, provided he had the talent, the industry, and the perseverance? He was as anxious as any man that all should participate, and that all should feel an interest in the Government of the country; and he believed that, as long as they had not class legislation, they could not have the basis of the electoral franchise much too wide. But when a country had prospered as England had done (and if they expected universal prosperity they would be sure to meet with disappointment), and when they found that there was no grievance that did not find champions in the House of Commons, surely they could not tell him that there was any misrepresentation. At the same time it was a question so large that it would be presumption in him to enter deeply upon it. Suffice it to say that no man desired more heartily than himself to see it settled, and the electoral franchise enlarged if need be; but let it be done on constitutional principles. If they were labouring under the tyranny their forefathers did, there might be reasons for getting it removed; but while they saw that all were prosperous, and there was time to reason and see which was the best way, they ought not to jump blindfold into a great measure without knowing whether its effect upon the country was to be good or evil. He felt that England had before her a time of prosperity, provided they gave their attention to commerce, and brought their relations with foreign lands into a state that would induce them to take their manufactured articles; and in that case they would be able to take the farmer's produce, for as long as the people were employed they would be sure to get a remunerative price for their meat, if not for their corn. It was his belief that agriculture would rise out of its difficulties; but, depend upon it, it could only be done by a thorough cultivation of the soil. They could not be expected to farm against losses, but they all knew that a well-drained and deeply-cultivated field would stand against bad seasons better than one that was not so well cultivated.

Mr. J. S. **Gardiner**, of Borley, spoke at considerable length in favour of the repeal of the malt-tax. With regard to the argument that the money could not be spared, he said it was not for the advocates of malt-tax repeal to point out the means of making up the deficiency in the revenue, but he suggested that a tax of 2d. a gallon on beer would bring in an amount equal to the malt-tax. He also alluded to the question of steam ploughing, and observed that Mr. Greene was at present but a young hand, and he should not be surprised if in the course of a year or two the expenses of wear and tear and repairs were found to be so heavy that he would be a good deal less sanguine upon the subject of cultivating by steam. He (Mr. Gardiner) had not yet seen the system of steam cultivation that could be economically applied to the tillage of the soil.

VARIETIES OF THE POTATO.

The immense number of named and unnamed sorts of potatoes with which we are at present encumbered renders it bewildering to endeavour to select, either from trade catalogues or from other sources, such kinds as are really worth growing. Not many years back one could count on one's fingers nearly all the popular and staple varieties then in cultivation. In this part of the kingdom at least, the bulk of the sorts then grown consisted of the old Ash-leaf, Walnut-leaf July, Fortyfold, Lancashire, Kidney, Jersey Blue, and a little later the York Regent, together with a few others, but this was prior to the first outbreak of the potato disease. Out of evil, however, has come good, for unquestionably to the disease may be attributed the number of good new varieties which we now possess. Tired of bewailing their losses, growers thought it wise to attempt the raising of new and improved kinds that should possess a more healthy and vigorous constitution, and greater capacity to resist the attacks of the disease. How far they have succeeded in relation to the freedom from disease may be a matter of opinion; but with reference to vigour, prolificacy, and quality, there can be no question that we have now many varieties that in all these respects are vastly superior to those old kinds which they have almost or entirely superseded.

There are few names probably in connection with potato growing that have become more famous than that of Mr. Paterson, and although his labours in regard to the raising and cultivation of new varieties may not obtain a very warm appreciation in some quarters, yet speaking for myself, I do most sincerely believe that in the course of time, when those valuable sorts which he has sent out shall become better known, they will be as justly and as deservedly popular as any varieties now in cultivation. Mr. Paterson is not, indeed, the only one whose name is favourably associated with the potato, for we have Rivers' Royal Ash-leaf, Myatt's do., Dawe's Matchless, &c., all splendid varieties.

My object however at present is to allude to what I have been doing for a year or two past in the way of growing and testing some 80 kinds of potatoes, more especially as respects the present season and its results. I grew some 50 sorts last year, mostly in a small way; but having increased that quantity this year, I thought I would give them all as fair a trial as possible. I selected the best soil and situation in my garden for the purpose; and I also got a neighbour, a good practical gardener, with newly broken up fresh ground, to plant all the varieties I possessed, and others which he had obtained. We started in our trial with about equal quantities, and although his soil was of a gravelly character, and mine a deep though not rich loam, we obtained in almost every case equal results. Therefore I think it would not be wrong to assume that, as far as this part of the country is concerned, the description now given of the various sorts of potatoes experimented upon will be found to be correct.

The first batch which claims attention is the early kidney, which are unquestionably the earliest in cultivation. They consist of the old Ash-leaf, a fair cropper and good; Walnut-leaf, good in quality but very uncertain; Rivers' Royal Ash-leaf and Myatt's Prolific Ash-leaf, both first rate as regards produce and quality, and with very little difference except in the haulm, in which there is a trifling dissimilarity. An improved Ash-leaf, of my own selection is in every respect as good as the two just named, but with a more robust haulm, and is prized by me because I can obtain from it the best sampls, for early exhibition. Then come—the Red Ash-leaf, In all respects an excellent potato and very early; Queen's Oenw very early and a good cropper but close; British Queen, much the same but even closer; and Mona's Pride, a potato which, if praise could help it, should stand in the first rank of our early Potatoes, but as interested praise is not always a good recommendation, so has it proved in the case of this variety, which is not even a first early, being at least a week or ten days later than the others mentioned above; it is also very coarse, the larger tubers usually being hollow in the centre, and it boils close; it is, however, a good cropper. I have found one peculiarity about this potato, which is, that when the tubers push young shoots some are purple and some green, but when they come up and in digging, there is not the least difference between them; the haulm is usually single-stalked, and somewhat resembles that of the Walnut-leaf. I obtained my stock of it from a nurseryman in the North, who imported it direct from the Isle of Man.

Thus far I have particularised only those sorts which I have grown as first early kidneys. I believe there are many others sent out recently that are very good, but it is not my intention to say anything about what I have not tried, with this exception, that at our local exhibition in June a sample of the Early May Kidney was shown; it was very fine, and deservedly obtained a 1st prize.

First early rounds with me are not plentiful, the best being the Early Handsworth, the chief recommendation of which is that it produces a very handsome tuber for early competition; it has a distinct haulm, and is a fair cropper. Giant King is another very early round, but it is coarse, and wholly unfit for a gentleman's table.

Of second early rounds there is a considerable number, but none of them are probably earlier than our old friend the Fortyfold, although much greater producers. Of course I have grown the Fortyfold, also a variety known about here as the Brown Betty, a rough, netted potato, but in all other respects similar to the Fortyfold. Dalmahoy, also in this class, is a good cropper and first-rate; as are likewise the mealy Early Oxford, and Sutton's Tenweek. Daintree's Seedling, Prince Albert, and a variety grown largely about here for market purposes, called the French White, all of which are good croppers, are but of medium quality; while among others of really good quality and handsome in the tuber, but of medium productiveness, may be classed Golden Drop, Martin's Early Globe, British Queen, and the old Goldfinder. There are yet two potatoes in this class of which I must make particular mention; these are the Cheshire pink-eyed and the Early Emperor, or Somerset Red. The first of these, a white potato, with a pink eye, is very prolific, of first-rate table quality, and altogether one of the best of potatoes; the second, as its latter name implies, is a red potato, with a remarkably handsome, pebbly shape, netted skin, and very shallow eye; it is a good cropper, for table quality unsurpassed, and is altogether a sort fit "to set before a king." It it does as well elsewhere as it does about here, it must soon become a universal favourite.

A batch of what I have no doubt are very good potatoes was sent to me by my friend Mr. R. Fenn, of Woodstock, for trial with my other varieties. They consist of Fenn's Onwards, a seedling of his own, a second early round, good both as to crop and quality; Beehive, Mitchell's Early Albion, Shutford Seedling, and Hogg's Coldstream, four second early round varieties which with me were medium croppers, and very deficient in robustness, a quality so necessary for good crops; and two others, Daintree's Kidney and Huntingdonshire Kidney. Of these the last is a good cropper, but late, which is all I can say about it at present. With respect to Daintree's Kidney, which is certainly a very handsome potato, and a really good cropper, I was much disappointed to find that its cooking qualities were of the worse possible description, it being both close and stringy. Mr. Fenn showed samples of all these sorts at the International Exhibition in May last, and they were most deservedly admired, both for their size and the manner in which they had been preserved; and having seen these I was not a little surprised to find that my own produce of the same kinds should have been so small compared with his or others grown close by. I can only fancy that there must be most peculiarity in the soil at Woodstock which these potatoes have missed with me, and therefore I shall say nothing further about them until I have given them another trial.

I now come to what I shall call second early kidneys, a section which comprises some of the very best potatoes in cultivation. The first I shall mention we call here Haigh's Seedling, a pebble-shaped potato, one of the earliest of this batch; it is very prolific, and good in flavour, but it is rather yellow; then comes Wimborn Kidney, slightly netted, a good cropper, and first-rate in quality; the White Blossom and Jackson's Kidney being also exceedingly good in every respect. Pink Ashleaf is a heavy cropper and good in quality; it is slightly marked with red. Maybush Prolific, a selection of my own, is also a heavy cropper, and good in flavour, but it is rather yellow in colour. Birmingham Prize-taker is a very handsome smooth-skinned potato, a medium cropper, but good in quality. To this section must also be added Dawe's Matchless, Prince of Wales, and the King of Potatoes, all as large croppers, and as fine samples as any in cultivation. Dawe's Matchless is a universal favourite about here; its quality is "matchless," it is fit for any table as soon as it is dug, and it will keep as long as any variety with which I am acquainted; at our local autumn exhibition it invariably takes the first prize. The Prince of Wales is in some respects a rival to the Matchless, both as regards size and quality, but it lacks the whiteness and quality of the Matchless. The King is a smooth-skinned potato, a large cropper and good in flavour, but, like the Prince, it is rather yellow in colour.

There are now a few late kidneys, of which the Lapstone is one of the most prominent. Of course every one knows it as being a good cropper, and first-rate in quality. The Burmah Kidney is also very good. To a batch of four kinds of the Fluke—the King, the Queen, the Pink, and the Original Fluke, the same description will apply; they all crop well and cook well, but when cooked they do not possess any appreciable difference one from another. There are two more late kidneys to notice, which I have not grown, but samples of them have been given to me by Mr. Cross, of Melchet, where I saw them dug up. They are West's Whytam Seedling, a purple kidney, a large cropper, and a very fine sample; and another kidney called Red Seedling, as fine as the other. If the qualities of these potatoes are as good as their cropping properties, they are first-rate.

We now come to the late rounds, among which there are Walker's Improved Regent, which is nothing particular; the Scotch Regent, an immense cropper, good in quality, and first-rate for a main crop; Red Regent, a very fine potato, a large cropper and good in quality, but very coarse in the haulm—a great objection; Arrowsmith's Seedling, a hollow-eyed potato marked with red, crop and quality good; and three others, all of very large size, and great croppers, well adapted for field or cottage culture, but totally unfit for a gentleman's table, viz., Old Jersey Blue, Farmer's Glory or Large Forty-fold, with very deep eyes, and Irish White, an immense cropper, of fair quality, but with very deep eyes and ungainly shape.

I have yet one other lot to mention, and then I have done; these consist of thirteen varieties of Mr. Paterson's raising, which I have grown. First among them come Paterson's Early White Round, a second early, a good cropper, and excellent in quality; then we have Scotch Blue, a second early, a medium cropper, but very handsome in the tuber, the colour being rich purple; it has a pebbly shape, and boils very white and mealy. Here are also two kidneys, viz., Early Red and Buff, but neither possessing any distinguishing qualities. Four late white rounds come next, viz., Victoria, Napoleon, Albert, and Regent; these are all good croppers, and of first-rate table quality. Of coloured varieties, Paterson's Blue, Irish Blue, Oval Blue, Alexandra, and Zebra, in strong soils all yield enormously, but I believe Alexandra to be the best of the batch; they are, however, more adapted for field than for garden culture.

As I alluded to the potato disease in the earlier part of this paper, I expect some of your readers will feel disappointed because I have made no mention of the capacity of the kinds I have grown, to withstand that malady more or less. Well, really I have not had a diseased tuber in all my garden this year, and in this respect perhaps I have been more fortunate than many others; the blight certainly presented itself in the haulm in a virulent form, but it was just at a time when the soil was very dry, and the flow of the sap was very much checked, and to these circumstances do I attribute my freedom from disease this year.

I should be very happy if one result of this paper should be to evoke from growers, such as Mr. Fenn and others, some further discussion of this potato question, and especially if it should elicit what effect differences of soil and climate have upon distinct varieties. What I have stated has only reference to my own locality, let others speak for theirs; and if no other good should result, it may at least be the means of affording useful information as to what are generally the best kinds, and the soils best suited for their growth.—*A. D., Maybush, in Gardener's Chronicle.*

THE CULTIVATION OF THE HOP.

At the Withington Ploughing Match Dinner Mr. **Flewett** said: The first step towards the successful cultivation of the hop plant was the thorough drainage of the soil; and having had extensive experience in the drainage of land, he could upon the present occasion lay before them the result of a series of careful experiments that had been taken by himself in conjunction with Mr. Andrews, a gentleman largely engaged as a land-agent over several estates; the experiments extending over the drainage of nearly 3,000 acres of land, and through a great variety of soils, from strong tenacious clays to porous sands and gravel. The land from which the drawings were made (Mr. Flewett here exhibited some nicely-finished drawings, showing the theory of capillary attraction through the earth) was a strong loam. They would perceive that the drains were cut 4 feet deep and 20 feet apart, the water rising in the centre between the drains to the height of 1 foot; but when the drains were placed 30 feet apart in the same soil the water rose 2 feet; at 40 feet apart in the same soil the water rose to within a foot of the surface; thus proving that in this particular description of soil the drains should not be placed more than 20 feet apart in order to secure a thorough drainage of the land. But they were all aware that this theory would not apply to a strong clay soil, nor to a sand and gravel, as no rule can be laid down for the drainage of all soils; but all must admit that if the land is allowed to remain full of cold spring water the beautiful rains that fall cannot enter into combination with the soil, but run over the surface into the nearest ditch. This is not the case if the land is drained; the earth then absorbs the rain, and at the same time acts as a filter and extracts from the rain the ammonia and other valuable fertilizing properties which it brings down in its passage from the clouds. Again, we know that as soon as the roots of any plant come in contact with cold water this necessarily retards its growth, unless it is an aquatic one. It is, therefore, of the greatest importance that the land should be thoroughly drained for such a sensitive plant as the hop. Having, through the kindness of Mr. W. Taylor, of Thingehill, been supplied with a sample of soil from one of his hop-yards, I am in a position to lay before you the result of a very careful analysis made by myself and two other gentlemen, professors of chemistry. The following I find to be the constituent parts of the sample I received:

ANALYSIS OF SOIL FROM MR. TAYLOR'S HOP-YARD, THINGEHILL.

Moisture	6.45
Organic matter and water of combustion	3.40
Phosphoric acid	7.50
Oxide of iron and alumina	14.84
Carbonate of lime	13.80
Silicate of lime	2.86
Lime	5.00
Magnesium	0.65
Sand and other matter	45.50
	100.0

These particulars give us the information that a good hop soil, as well as being rich in phosphoric acid and potash, must also contain a fair proportion of lime. I have no doubt the high character of some of our hop grounds could, by an analysis of the soil and subsoil, be traced to be mainly due to the richness in phosphoric acid, potash, and lime. I believe it is the richness of our soils in these three ingredients that constitutes their fitness for the successful growth of hops. Coming to the cultivation of the hop, I do not wish for a moment to dogmatize, nor do I pretend to state the best way of treating or managing hop lands, since I know that I am speaking in the presence of some of the most successful hop-growers of the district. At the same time permit me to state that, if I can by an analysis of the soil throw any light upon the cultivation, or in any way assist the cultivator, I shall always feel a pleasure in so doing. A careful analysis of the soils we cultivate, and the manures we use, is most valuable in many way. An anylysis, to be of any use, must be made with great care and accuracy, as the most important of inorganic substances are found in small quantities. Now, coming to the subject of manure, which I have to bring under your notice, the first point we have to consider is—what is manure? This is a simple question, and yet one which involves a great many considerations. A manure is something we put to the soil to promote the growth of the crops, by supplying food to the plant, and the most typical manure, farmyard manure, is a substance that supplies to the crop what it requires. And here I may state that I have upon many occasions, in passing up and down this county, seen large quantities of not well-rotted farmyard manure cast into the hop-yards. This, in my opinion, is not a right course to pursue, as I fear that the too frequent application of farmyard manure tends to mould in the plant; but in order to obviate this I should strongly recommend the manure to be made up into a compost of lime and soil; and here I beg to be distinctly understood that the lime is not to be applied to the manure unless in conjunction with soil, for such are the absorbent powers of soil that, as soon as the ammonia contained in the manure is set free by the lime, it is at once absorbed by the soil, as one cubic foot of soil is capable of absorbing fifteen cubic feet of ammonia. The action of the lime upon the manure will destroy any fungi that may exist. When we turn our attention from the plant to the soil, we find that the substances most essential to the hop plant exist in the smallest proportion in the soil, namely, phosphorus and lime and potash. In applying manure our object is to obtain from the soil a larger quantity of produce than it would yield in a state of nature, and we are to obtain this larger produce partly by tillage and partly by suitable manures. I find from examination that a few of the principal roots of the hop strike down immediately into the subsoil, but a considerably larger number of the smaller roots and fibres strike off in a lateral direction, and intersect each other across the furrows. I have here prepared a diagram of a system of manuring which I have much pleasuring in submitting for the opinion of the practical gentlemen present. Knowing that all manures must become soluble before they can be taken up by the plants, I am of opinion that if the land was manured in the autumn, say about six feet wide in between the ridges and properly dug in with forks, this manure would then be more available for the use of the plants in the spring. Of course, this is simply a suggestion of my own, being quite aware that if the manure is spread over the whole surface of the ground it would eventually find its way to the roots of the plants, my object in making this drawing and calling your attention to the system being for the purpose of forwarding the work in the spring, and at the same time assisting the growth of the plant by the manure having been rendered into a more fit state to be assimilated by the plant. I now take the opportunity of submitting for your inspection a sketch for the purpose of superseding the use of hop-poles, which I find I made in May, 1865, and intended to have sent it to Mr. John Bosley, but from some cause or other it was overlooked. You will perceive by the sketch that it is intended to employ wire strained between two standard posts, jointly fixed in the ground, say about 12 feet high and 30 to 40 feet asunder, the upright rods for supporting the bine being hooked on to the horizontal wire at the top and into a staple or eye in an oak stake, 18 inches long, that is to be driven into the ground in the same position as hop-poles are at present pitched. Of course, you can have what number of rods you like to each hop-stock. I have in the drawing only shown three. When hop-picking time arrives it is only requisite to unhook the upright rods from the horizontal wire and the stake, and carry to crib as is usual. In conclusion, permit me to thank you for the kind attention you have paid to my remarks, and if any of them are found to be in any way beneficial I shall feel amply compensated for the trouble I have taken.

Mr. **Holloway** observed that there were cases in which hop-growers had not used manure at all, and yet there was mould.

Mr. **Hall** said such might be the case, but the tendency of the fungi was to produce it.

Mr. Vevers said this was a most important subject, and if he could make any remarks which would be of any worth, he should be glad. It would be a great thing if they could reduce the expense they had to incur in the purchase of hop-poles. He thought with the aid of the strained wire—strained like a telegraph wire—they might make use of a smaller pole, say a hedder. He thought if a hedder was attached to the wire the plan suggested might be carried out. As he had observed, if they had a second wire about 18 inches from the ground, secured at each end as a telegraph wire was secured, then he thought lighter poles might be used by making them to rest upon the wire. These light poles, with a saw niche in the bottom, could be attached to the wires by cocoanut fibres; and he thought a great deal might be done in saving expense if it were practicable to grow hops round wire. Now if, as has been shown, it was practicable to grow hops round a wire no thicker than a knitting-needle, it must be practicable to grow it round a wire five or six times thicker. But suppose they added the hedders or light poles to the wire system. These hedders would only cost about two shillings a hundred, and they would only want to be supported by one wire, though if they liked could have another wire at the bottom. This, he thought, would be a very much cheaper plan of poling their hops than the method at present adopted, and he saw no reason why it should not be carried out (Hear, hear).

Mr. Bosley inquired how long the hedders would last.

Mr. Vevers replied that he thought they would last several years—five or six, if not much in the wet.

Mr. Hodges said he did not think they would last so long.

Mr. Watkins remarked that the light poles would last about four years.

Mr. Vevers: The poles would be left attached to the wires.

Mr. Bosley: How would they get the hops to the crib?

Mr. Vevers: They must be cut off. He thought the wire plan might be adopted with advantage.

Mr. Hall said he would advise those who wanted to get the best information upon this subject to go into the best parts of Kent. He had the pleasure of visiting that county last week, and of staying with Mr. Elvy, of Bow Hall, a large and successful grower of hops, who grew £20,000 worth of hops in the last year. Their plan in Kent was to get well-rotted dung, rags, bones, rape-cake, and dig it in evenly some ten or twelve inches deep. Many of the best planters in that county had already had the dung put in their hop-yards in this way. Within the last two years there had been a great extension of the cultivation of hops. The prices of hops were rising, and the price of poles had also increased 10s. or 12s. per 100.

Mr. Taylor understood that Mr. Hall said that the Kent hop-growers put the manure over the whole ground.

Mr. Hall said that was quite right.

SEWAGE AND PESTILENCE.

Sir,—Just now, when typhus fever and other maladies are making their appearance in Adelaide, more especially in the vicinity of the Hospital and Botanic Garden, in a most malignant form, the following article which I have taken from the *Weser Zeitung* may be read with interest, and perhaps prompt the taking of measures to check the progress of this evil. The *Weser Zeitung* says:

"The cholera has shown its gloomy face once more in Europe, and no hope can be entertained, if we judge from its former career, that it will soon leave us. The commissions which have been formed in several of the larger cities to consider how to prevent the further spread of the epidemic will have every opportunity to prosecute their researches. All such researches must converge towards one point—that is, to find out the exact origin of the disease. Concerning its nature we gave, some time ago, an extract from the latest work of Mr. Pettenkofer, which describes all the researches made up to the present time by science with regard to this malady. According to these, the origin of epidemic cholera is an organic substance, a fungus (*spores*), which as yet has escaped observation, even where the eye has been assisted by the strongest microscope, but which without a doubt causes the most terrible of diseases by penetrating in numbers into the lungs and stomach of the human body. Like every other organic substance, the cholera fungi (*spores*) require a peculiar soil to thrive in. Only when the soil is soaked with stagnant water and putrefying organic substances, such as are produced when too many people live together, the cholera will flourish. All large cities stand on poisoned ground, and the carelessness with which all noxious matters are allowed to penetrate the soil and to decompose is the cause of death to thousands and thousands. Observation has convincingly proved that drinking out of a well which is situated in an unfavourable place has increased the percentage of mortality from epidemics. 'What is called when in the wrong place "filth," would be called in the right place "manure,"' was a celebrated saying of Lord Palmerston. The task of a sanitary board should be to see that every thing is in its right place and nothing in its wrong place. Its aim should not only be to neutralize the infectiousness of cholera, typhus fever, and other similar diseases, but likewise to prevent the future poisoning of large cities, and to mitigate as far as possible the consequences of those evils which are already prevalent."

The magazine *Unsere Zeit* (Our Time), published, at the beginning of the year, two articles on "The Disinfection of Cities," by Wilhelm Hamm, which, though they perhaps do not settle the point, furnish useful material for doing so. We learn from Mr. Hamm's works that there are two opposite systems for purifying cities—the one by removing the filth by sewers, and the other by carting it away. In some cities, as in Berlin, there have been great disputes as to which is more effective. Sewerage removes impure matter by an extended system of a gradient, conducting it several miles below the town into flowing water. This system has the advantage of keeping a town thoroughly clean; and London, where it has been carried to its greatest perfection, enjoys of all the large cities the most favourable state of health. Yet this system has two disadvantages. It takes away the matter from the wrong place, where it is filth, but it does not conduct it to the right place, where it would be manure. It withholds the filth from agriculture, and tends to exhaust the land and to lessen its productive qualities. Moreover, it conducts the whole of the filth back to the river, and forms in the same a new source of poisoning. The old system of removing filth confines itself to turning the matter into pits, thereby saturating the soil in the cities with putridity, and then carrying it away to the farmer. This system also has two disadvantages—it causes the diffusion of gases at once disagreeable and noxious in streets and houses, where its influence on health is greater than generally acknowledged. This disadvantage people attempt to check by throwing green copperas (chloride of zinc) or other corrosive matter into the cesspool. Agriculture is assisted by the changing of the filthy refuse into useful manure; yet nothing has been found as yet to effectually neutralize the noxious gases and the consequent danger of epidemic contagion. Besides, the manufacturing of poudrette and similar things is such abominable employment that no man should be asked to undertake it. There is nothing less clean than the act of producing cleanliness.

From this dilemma between sewerage and the old system of carting away neither practice nor science has discovered a satisfactory escape. We do not even find it in the essay of Mr. Hamm. Clearer and more to the point is another essay. In Frankfort-on-the-Maine, where at present an active interest is being shown in municipal improvements, Dr. Thudichum, a German physician who holds the Professorship of Pathological Chemistry at St. Thomas's Hospital, London, was invited to deliver a lecture on the above subject, which he did on the 8th June, 1865. The lecture has since been published under the title "On the Fundamental Principles of Public Health in Cities, founded on the Basis of Medical Investigation *(Frankfurt Baist-commission)*." Dr. Thudichum is alike at home in practice and science. He is well acquainted with the different systems of England, France, and Germany. He is also familiar with the laws of hygeine, and has acquired the necessary knowledge of agriculture, national economy, and engineering. His verdict is for sewerage, but with the condition that the water running off should not be let directly into the river, but used for the irrigation of meadows. The water is first led into store-basins, which are divided into different compartments by partitions made of dry reeds or perforated deal boards. Through these partitions the water flows slowly, and is thereby strained. In a very short time all the mud is deposited, and the clear, scentless water, containing in solution seven-eighths of the original strength of the sewage, runs on to the meadows, soaks into the ground, is there purified, and in the end returns to the river in a state, if anything, clearer than when it left it. The meadows change the filth into grass, and the cattle fattened with that grass supply the fields with what is most essential to them. The deposit in the store-basins has lost its offensive qualities, is dried, and has even then its value as manure. This system has been adopted in several English towns, and is found to answer every purpose. It cleanses the town without defiling the rivers; it returns to agriculture everything of value to it, whilst it leaves to nature the process of producing poudrette. Dr. Thudichum has suggested a modification to this system for cities which have no meadows available in their neighbourhood. The essay is interesting, and is written in a very illustrative style. Whether or not its conclusions are correct scientific men must decide. I do not know if his data can be contradicted, but I know that they must not be ignored. Whoever is obliged to frequently wend his way homeward in the night-time must have often desired that the effusions which then charm more than one of his senses might be brought under the control of science.

This subject, though by no means pleasant, is of infinite importance. Pure air, health, cleanliness for everybody are the most essential things to promote comfort, prosperity, and civilization. There is nothing more inhuman, nothing less politic in a State, than to undermine the principles of health. It is a difficult task to render justice to the rival demands of the medical fraternity, the agriculturists, and the men of science, but no town population should fail to give it their most active sympathy and consideration. The time for Adelaide to do this has fully arrived.

I am, Sir, &c.,
Dr. C. Muecke.

Tanunda, August 3.

—In *Adelaide Observer*.

THE UTILISATION OF THE LIVERPOOL SEWAGE.

On Thursday, the 29th of November, a meeting was held in the Law Association Rooms, Cook-street, for the purpose of hearing addresses as to the importance of utilising the sewage of large towns. Mr. Edward Lawrence was called to the chair, and there was a large attendance, among those present being Lord Robert Montagu, M.P.

The Chairman said: The question of the disposal of the sewage of our large towns was admitted on all hands to be one of very vital importance, and one which was receiving in the present day an amount of consideration which it never had before. He feared that, in days gone by, the question of the possibility of utilising sewage scarcely entered into men's minds, or at all events, if it did, it only entered to be dismissed, in too many instances, as a thing perfectly impracticable. But probably he should offend his friends who took a deep interest in that matter if he were to attempt for one moment to question the fact that the question of utilisation had been definitively set at rest. It was quite true that the attempts which had been made to utilise sewage in different parts of the country had not been all entirely successful, and that perhaps depended rather upon local conditions, and upon questions of management which did not affect in any way the main question at issue. Now, if the facts were admitted that the sewage of our towns could be utilised, the great question for consideration was—in what way it could best be so applied (Hear, hear). That was a question which involved very many considerations, and it involved many considerations which would differ in different localities. It involved the question as to the best mode of collecting the sewage, not only with reference to its application to the land, but with reference to the sanitary conditions of the towns in which it was collected. Now, that latter was essentially the primary consideration, and it was one which was particularly interesting to them in Liverpool at the present time. No doubt opinions would ever differ upon that point, but he thought in Liverpool, in spite of some little differences still existing amongst them, they had—at all events the vast majority of them had—made up their minds that the system which they had lately adopted for the purpose, if he might be allowed the expression, of collecting their sewage by means of the water-closet system, was the one which was best calculated to promote the sanitary condition of the inhabitants of this town. He believed the question had been raised by some gentlemen as to whether that system would not have a deteriorating effect upon the quality of the sewage itself; but so far as he had been able to ascertain, he believed that the plan which they were proposing to themselves to carry out as thoroughly as they found it practicable in Liverpool, was the one which embraced those considerations which were best adapted for its application to the land. They would agree with him that anything which could tend to enlighten the public mind on that subject must be of very great importance to them—not only to the country at large, but also to Liverpool especially, and they would be delighted to hear from gentlemen present those facts which they were so able to place before them. They were extremely fortunate in having the presence that day of a nobleman who had taken a deep interest in that subject—he alluded to Lord Robert Montagu. Having highly eulogized that nobleman for the position which he had taken with reference to sanitary affairs, the chairman called upon Lord Robert to make some remarks, which, he said, would no doubt be received with that attention which the subject claimed at their hands.

Lord Robert Montagu, M.P., said an apology, perhaps, would scarcely be expected from him for introducing to their notice a subject of the greatest importance to all men—a subject of importance to the capitalist, to the farmer, and to the municipalities. He might say, perhaps, one word to show them that he had not ventured to call their attention without some qualification. He alluded to the fact that 15 years ago he himself tried the utilisation of sewage upon land, and so astonished was he with the results that he then determined that if ever an opportunity offered he would do all in his power to urge the general utilisation of sewage throughout the country. He spoke, therefore, from experience. They remembered that in the year 1864, when the House of Commons gave him a committee to investigate the whole subject, and on that committee some of the most able members of Parliament consented to serve, they were unanimous in the decision to which they came. The result of it was that in the succeeding year, 1865, he introduced two bills to the House. One received the assent of the Government, and passed without opposition—he alluded to the present Sewage Utilisation Act. The other bill was of too large a scope. It was for erecting boards for the management of the whole of the watersheds throughout the kingdom. That bill had been put aside, but it had been since used with respect to the Thames watersheds. He proposed to show, first, the absolute necessity of utilising the sewage of towns; secondly, the enormous gain that might be expected to accrue from such a practice. If they went back to ancient times it would be found that before there was any written law every man had, by common law, a right to pure water and pure air. The first statute which applied to the subject was as early as the 12th Richard II.—a statute enjoining all mayors of towns to forbid the throwing of any filth, offal, or noxious matters into the sewers, water-courses, rivers, or ponds of water. Until the year 1847 the plan was for scavengers to take the excretions out of the town in carts. What was the result of that system? Why, those tremendous zymotic diseases which spread all over the country, and carried off tens of thousands of people. There were various visitations of cholera before the year 1840, and the Government were induced to turn their attention to the subject of the health of towns. Boards of health were appointed, commissioners were engaged in investigating the subject, scientific men turned their attention to it, and the result was the elaborate report of the sanitary board of 1842. In consequence of this, it was resolved that the cesspits of houses should be done away with. The plan first used was to put water into the cesspits, and then pump them out into the sewers. In the year 1847 the Board of Health advocated an efficient water supply and a complete sewerage for every town in the kingdom. Then, instead of separate cesspits for each house, the houses were connected by means of drains with the sewers. Thence sprang a very great evil. As the houses were purified, as the air was rendered pure, the rivers became impure. They had before them the choice of two evils or two benefits. The two evils were poisoned rivers and a loss of valuable manure, and the two benefits fine rivers and great agricultural prosperity. From poisoned rivers they got infected air and infected water, the consequence of which was disease and the concomitant evils drunkenness and crime. The conclusion he drew was, that the excreta must be removed from the houses as speedily as possible; and he maintained that the excreta must be removed by means of water. Then arose the first point of discussion with the advocates of earth-closets. It was merely the old question between sewers and cesspits—whether these excreta should be removed by the hands of man or by the agency of water. The earth closets had been tried at Aldershot, and had failed, besides entailing a cost upon the War-office of £600 a year. The earth-closet was the invention of the Rev. Mr. Moule; and he had stated that 3,000,000 tons of dried earth would be required annually for the 3,000,000 inhabitants of London. The meaning of that was, that they would have every year to dig a hole one foot deep over an area of 1,516 acres. Dr. Hawkesley had advocated the same system at Liverpool; but his figures only went to the extent of showing what an enormous obstruction to the traffic of the streets, and how enormously costly such a system would be. The other proposition was the removal of the excreta by means of water. He maintained that such a means would be not only easier than removing it in carts, but much cheaper. The reservoir of the best Middlesex waterworks had become silted up to the extent of four feet. Estimates were sent in for removing this by hand, in a period of four weeks, at a cost of £400. A young engineer, however, bethought himself that, as the water had carried in the sediment, it might carry it out; so he set a few Irishmen to puddle it, and let the water carry it out. The consequence was that it was got out in four days at a cost of £40. The conclusion of this and other experiments was, that it would be cheaper and better to remove the excreta by means of water. They then came to the alternative, what was to be done with the sewage when it was in the sewers? Engineers who were called upon to purify the town of its sewage naturally looked to the river, which would necessarily be in the lowest part of the town, to extricate them from their difficulty, and into the river the sewage went. What did they find was the result of the pollution of the rivers? The same as that arising from the pollution of the air. Dr. Acland, the Regius Professor of Physic at Oxford, had stated that if disease was not actively propagated by the rivers, the population inhabiting their banks got into a low state of health, and constantly required stimulants. Dr. Simon, the medical officer of the Privy Council, had stated that the diarrhœal or choleraic state of towns was attributable to the quality of the drinking water used in those towns. Dr. Simon had been the first to show that the presence of cholera in London was due to impure water. The statements of these gentlemen had been fully borne out by the Registrar-General's returns with respect to cholera in London. Where the impure water of the East London Company was drunk, there cholera prevailed; where the East London water mixed with that of other companies had been used, the disease prevailed in a less degree. The same evidence had been supplied at North Shields, in the case of the water from the Preston Pits. "Cholera and diarrhœa never destroy people where water is pure," says the Registrar-General in his report. Dr. Acland has stated that the Thames was a disgrace to the nation. The people of London were compelled to drink the sewage of between 800,000 to 1,000,000 persons—a thing which no amount of filtration could prevent. It was the same thing with respect to the Tame at Birmingham. Mr. Rawlinson, the Government engineer, had stated that no words could describe the abominable state of the rivers of Lancashire. The evil of this was one which touched their pocket. The municipalities who used to resort to the rivers for water supply had been obliged to spend enormous sums in waterworks. Since the year 1848 a sum of over 22 millions had been spent in this way. Further expenditure was considered necessary. Stupendous schemes, such as that for supplying Liverpool from Bala Lake, and London from some place at the back of Plinlimmon, at the expense of £10,000,000, had been propounded. That was the fine they had to pay for polluting their rivers. It might be said that the sewage could be deodorised or disinfected. That had been tried at several places and had failed signally. They came then to this conclusion, that the sewage must not be poured into rivers, and to the alternative that it must be put on land. That was the conclusion to which the nation had come, which was proved by recent legislation, such as the Thames Navigation Bill and other measures. He would proceed to show how such a proposal would be a means of enormous gain. Irrigation by pure water, without the advantage of the manurial elements, was practised with the greatest benefit in Mexico, Ceylon and China. Millions of acres of grass land were irrigated every year in the plains of Lombardy, and it was found that every acre of grass land so irrigated produced a corresponding profit. If that was the case with respect to irrigation by pure water without sewage, the sewage irrigation should *a fortiori* be much more beneficial in its effects. They took away from the land every year the elements of fertility, and unless these were restored to the ground in some shape, the ground of necessity grew poorer. The most natural course, therefore, was to return the natural elements to the land, instead of pouring them into the river. If they did not do that, they were living on the principal instead of their interest, the folly of which he illustrated by the anecdote of Fouvier and the hen-eggs, and the conduct of the father of Alexander Pope. They were paying away £4,000,000 yearly for guano, and £1,400,000 for artificial manure. When they added to this the £16,000,000 which they paid away for corn to America and the Danubian Principalities, and which sum ought to go into the pockets of the English farmer, they had a waste of nearly £22,000,000 a-year, besides which we had to import cattle from abroad. In Belgium, where the sewage was utilised, the land supported 40 people more per square mile than in England. Besides, on the English system, as the population increased, the expenditure for artificial manure and the rest increased; but, if they utilised their sewage, as the population increased, their fertilising agencies would increase with it. The results of the experiments made in England would doubtless astonish them, and they might, perhaps, be received with incredulity. But so were the statements of Mr. Stephenson; so were the announcements on the introduction of gas. But these statements were made upon the testimony of some men, among others, who at all events would not be prejudiced in favour of the sewage scheme. He alluded to a scientific man who had spoken against the scheme before the committee of the House of Commons, and that a manufacturer of artificial manure. He would read from the report of the commissioners of last year. The amount of grass obtained from an acre of unsewaged land in the year 1861 was 9 tons 5 cwt. 3 qrs.; from an acre on which 6,000 tons of sewage had been spread, 27 tons 1 cwt.; and from an acre on which 9,000 tons had been spread, 32 tons 16 cwt. 3 qrs. Similar results had followed in 1862 and 1863, with the difference that the productiveness of the sewage land increased, while that of the unsewaged land diminished. With respect to milk the results were the same. In 1862, after the system had been in operation for two years, the production of milk from an unsewered acre during twelve weeks was 431 gallons, and from a sewered acre 1,145 gallons. He would next go to the actual experiment which had been made in other towns. At Edinburgh the result of the experiment had been that the land which came under the sewage let at an enormously-increased rental, and the same thing had occurred at Croydon, where, after many difficulties, they had been compelled by injunction so to utilise their sewage. Land at Croydon, which formerly let for 30s. an acre, was now being let for £5 and upwards. Experiments had been made at Worthing with a similar result. Let them reflect that if they only put the value of the sewage at 6s. for each inhabitant in Liverpool, it would be worth £150,000 a year, which would accrue as profit to the town if the sewage were utilised. He besought them to turn that which was a source of nuisance throughout the country into a source of wealth, to remove the infection of the air, the poison from the water, and by so doing to obviate evils which had already grown to be unbearable. They infected the air, and the air revenged itself upon them; they polluted the water, and the water punished them. The land was crying out to be enriched; and if they poured upon it that sewage which was now being worse than wasted, he promised them that unbounded wealth would be their reward.

Mr. J. F. **Bateman**, C.E., said the experiments made showed that where sewage had been utilised the result had been a considerable improvement in the value of land. The work proposed to be tried in Liverpool was extremely simple. It was not proposed to carry out the whole scheme, but merely a portion of it, so as to enable the public to realise the fact that sewage could be utilised. The company formed in Liverpool intended to try two or three hundred acres, or more if necessary, at the north end of the town; to place the pumping station at Sandhills; and to put down sufficient pumping power to raise a million gallons of sewage; and the ground, so far as his information enabled him to judge, was very suitable for the experiment.

Mr. R. **Neilson** thought it might not be generally known what was the actual weight of water distributed over an acre of land during a heavy shower of rain. An inch of water over an acre represented the weight of 100 tons; notwithstanding we had had such heavy floods during the last month, on no one day had one inch of rain fallen; and any gentleman acquainted with land knew the value of water; and considering the matter merely as a question of water, it would be highly beneficial to the agriculturist to pay even a very large premium upon the cost incurred by the proposed company in distributing the sewage on the land. As to the land on which the experiment was to be made, Major Blundell had promised to support the experiment in the most liberal manner. He (Mr. Neilson) had, as a farmer, tried irrigation in a small way, and Mr. Harold Littledale had tried it to a still greater extent, and in both cases the result had been most beneficial.

Mr. J. A. **Tinne** remarked that as an old sanitary reformer, and a former chairman of the Health Committee, it was pleasing to him to find there was now a prospect of a scheme being carried out, which, in the days when he took an interest in the subject, one hardly dared to hope would be accomplished.

After some remarks from several gentlemen present,

Mr. **Neilson** observed that after the very lucid, clear, and exhaustive statement of Lord Montagu, they ought to thank his lordship for the very kind manner in which he had come forward with the view of giving them important information.

Mr. **Thomas Weld-Blundell** seconded the motion, which was carried by acclamation.

Lord **Robert Montagu**, M.P., acknowledged the compliment, and said he was really desirous of the system being tried by the rich and powerful town of Liverpool with its hundreds of thousands of inhabitants, and he had no doubt the result would be as satisfactory as it was in the case of Croydon with its 43,000 inhabitants. Should it be so, all the arguments hitherto advanced against the utilisation of sewage would be proved to be futile, and would be swept away.

Mr. **Robertson Gladstone** said no scheme for the collecting the sewage of Liverpool could be completed that did not include the thorough destruction of the present privy system, and converting those horrible "institutions" into water-closets. He had no doubt that the principle involved was extremely convenient and justifiable in the time of Adam and Eve; but in the present day it was, to say the least, extremely disreputable. As to the matter of expense, and those very disagreeable things, local rates, he believed, if the new system was thoroughly carried out, it would result in a saving of at least one-third of the money now expended. The most expensive thing was the night establishment for emptying the privies of Liverpool, and they must get rid of that most horrible system, the emptying of the cesspools and privies throughout the town.

The **Chairman** said he felt sure that the Corporation of Liverpool, which had made an important concession to the company as to the sewage of the town for the next twenty-five years, would do everything in its power to further the object in view.

This terminated the proceedings.

STEAM CULTURE.

The second discussion meeting of the Royal Bucks Agricultural Association was held on Wednesday evening, at Aylesbury, but there was not a numerous attendance. Colonel Caulfeild Pratt took the chair.

Mr. J. K. **Fowler** said: Jumping over a great gap of time, I shall now plunge *in medias res*, and say that in 1856—I believe I am correct in the date—a shrewd, clever, practical Buckinghamshire farmer, "William Smith of Woolston," put the crude theories of steam cultivation into practice, and commenced really the cultivation of heavy clay land by steam power. Now, gentlemen, I must at once say, that one of the greatest mistakes that has been made has been in calling this system "steam ploughing." It is not, and it never was intended to be, in any way ploughing. Mr. Smith of Woolston, like many others, had observed that for many years past all our great agricultural machine makers had been inventing scarifiers, scufflers, grubbers, and skim ploughs, to raise to the surface those curses of all strong-land farmers—couch grass, docks, and thistles, so that the autumnal suns and the frosts of winter would kill them. But what was the process? What is the process now carried on? First the land is broken up by four or five great heavy horses; then it is, to use a country word, "thwarted" or crossed; and when that is done, all the above implements are put in requisition, to say nothing of my ancient friend that most elegant and easily-moved implement, the drag harrow—to do what? Why, to effect that which Smith's steam cultivator does at its first operation—lay all the weeds on the surface. Now, this is no exaggeration. Mr. Smith said he saw a new power to use in the cultivation of the land; and he said we must have a new implement: henceforth the plough must go, and he then uttered this most truthful agricultural dogma, "The plough is the farmer's best filth planter." Any practical man must see at once that the first operation of a plough is to plant all the filth in the land, and that all succeeding operations are but the means of getting it again to the surface that it may be more easily destroyed. I shall not enter into the *vexata quæstio* about priority of invention, or which is the best system to be adopted; it has been so constantly before the public, that I shall leave the agriculturists themselves to judge from the effects they see on land which has been under steam cultivation, which plan they deem the best for their purpose; but in a paper of this description some account should be given of the systems now in use. I think I may say there are three plans in general use which at present take the lead—Smith's, Fowler's, and Howard's. There are others of considerable merit, such as Savory's, Coleman's, &c.; but the above three are in full operation, and have each produced extraordinary results. The main features in these systems are—1st, Smith's is essentially a grubber or cultivator, and is worked by an ordinary stationary engine at any part of a field, generally placed as conveniently as possible for water, and then snatch-blocks or anchors are placed at different angles of the field, and a steel wire rope is passed round or across the field round these anchors, and is wound and unwound on two separate drums of a windlass placed near the engine, and turned in the ordinary way by a strap round the driving wheels of both engine and windlass. The main difficulty Mr. Smith had to encounter was to know what to do with the slack rope, so as to pull the grubber back again after it had first crossed the field, and he at last succeeded in inventing a very simple plan, which he called a "turnbow," and on which he charged, I believe, a royalty of £20. This plan of Smith's was called the "roundabout" system. Mr. Fowler's may be described as the direct system, as he places his engine, a very expensive one, and not an ordinary farm engine, on the headland of a field, and a travelling anchor on the opposite headland, a wire rope being attached to the plough, which is generally one of four or five furrows, and hangs on the balance principle. The rope passes round a most ingeniously constructed apparatus, called a clip-drum affixed under the boiler of the engine, and winds up the rope, drawing the balance-plough after it; the furrow-plough which has been up in the air as it comes to the engine being on its return to the windlass on the opposite side of the field placed into work by a simple movement of the driver, and the furrow-plough which has been in the ground takes its place in the air back again; the windlass also, in a most singular manner, being attached to an anchor at one corner of the field, moves itself along simultaneously with the engine. Mr. Howard's plan is like Mr. Smith's, viz., the roundabout system, but he has a frame for his implement, carrying four or five coulters, with points and shares both in front and behind, so that the grubber or cultivator simply is moved backwards and forwards across the field, without the necessity of using Mr. Smith's turnbow. Mr. Howard has made several most important improvements in his windlass snatchblocks, and anchors, and the perfection to which he has brought the manufacture of the steel wire rope has been to a great extent the cause of the successful adaptation of steam to the cultivation of the land. Amongst others is that of a steam-engine with the boiler placed transverse or across the carriage, which enables the engine to travel up and down hills with great facility. I shall only say that it seems to me one of the great advantages of Smith's and Howard's plans over Fowler's is, that it matters not if the field be triangular, five-cornered, or ever so oddly shaped, or whether it be up-hill, down-hill, or with high ridges across the field, this roundabout system accomplishes its work thoroughly, and by crossing every bit of the land can be moved; but with Fowler's system, moving on the headlands, the fields must be square, and the water-cart must follow the engine, and on strong clay lands, where steam cultivation is of such vast importance, the kneading and treading of the headlands is a matter of great detriment. The advantages which the supporters of Fowler's system claim are, that the traction being direct the power of the engine to be exerted is less, and that only about one-half the rope is required to be used that the other two use. I have thus roughly and very imperfectly given you a slight sketch of each of the rival systems. In the statement I am about to make to you, you will find I have added the most important item of interest for capital; but I hope when gentlemen try to put these statements in comparison with horse labour, they won't forget wear and tear there; and that on an average a man is very lucky if his horses last four years each, which at £30 per horse, and selling him at £6, is £6 per annum depreciation on each horse—to say nothing of repairs of plough, tackle, harness, grease, and oil. Now, about five years ago, having seen and fully made up my mind that deep tillage was in future to be the sheet anchor of good farming, and autumn cultivation to be the means of thorough cleansing the land, and having torn to pieces two teams of horses, and broke lots of harness and implements in this attempt, I went to see Mr. Smith's stiff land at Woolston smashed up, and I came away determined to use it as soon as I had an opportunity; but as my occupation at that time was only 200 acres, about 105 being arable, I did not feel justified in purchasing my own set of tackle, and I hired of Mr. Moore, whose implements and rope were very weak, and he broke up about forty acres each year, at 25s. per acre twice over. The following year Mr. Lewis Taylor having purchased a new set of Messrs. Howards', I engaged him to break up all my land that required it, at the same price, and he did most excellent work; this convinced me, from the splendid crops of the next year, how thoroughly efficacious the plan was. The next year I took another farm of the same size, and at once bought a set of Smith's tackle, and set to work in earnest, and the first year—that is in 1864—I smashed up 150 acres twice over, at a depth of from eight to nine inches. The land was generally very tenacious clay, and being a very dry hot year, it was as hard as iron: pieces of clay came up weighing some cwts., and the dry autumn killed nearly all the couch-grass and weeds of the farm. The year 1865 I did the same, doing about the same amount of work, but this time much more easily, and breaking it up one inch deeper; and I will now give you the result of my operations as regards expenses. I must tell you that I hire my steam-engine, not having as yet a thrashing machine, and this is a heavy item. I will give it per diem:

	£.	s.	d.
Hire of engine—12-horse power............	0	14	0
Engine-driver	0	3	0
Windlass man	0	2	6
Two anchor-men	0	3	6
Two lads with rope porters..................	0	2	3
Oil and waste	0	1	6
Seven cwt. of coal	0	5	0
Beer—10 pots per day (plus malt-tax) ...	0	1	8
Interest on cost of apparatus, £220, and wear and tear, at 12½ per cent., on 40 days when used	0	14	0
Water-cart, horse, and boy	0	4	0
Total............................	£2	12	2

Average seven acres per day, or about 7s. 6d. per acre. Now, gentlemen, let me at once say that I consider price has nothing to do with the question, but I mention this so that there shall be nothing to carp at afterwards, and that I was afraid to show my figures; the great point was, that I had smashed up and made use of several thousands of tons of soil that had never been disintegrated before and never seen daylight. I had broken the pan of the earth that had been trodden and puddled for perhaps centuries by heavy horses year after year, and by means of this smashing up had rendered drainage on these stiff clays perfect. The water which formerly stood up the furrows and all over the land is now never seen; and above all, I had broken up all my land and completed everything in the way of autumn cultivation by the middle of October. I am convinced that subsoils are often poor because they are not properly cultivated, and they are in an unfit state to receive manure; but the system will alter all that, and these poor clay subsoils will be found rich in the best constituents of useful land. Now, gentlemen, I am prepared for the remarks that probably some persons this evening may mention. "What have you done this year?" I will tell you. This autumn I have done nothing; but I will answer this question by asking another: "What have you all been doing this autumn with your Bentalls, your scarifiers, your Colemans, your Turners, &c.? I am aware that in the majority of cases, where our harvest was so late, it was not economical to bring it out; but I know that Mr. Smith of Woolston, Mr. Howard, and scores of others have done lots of work this autumn. But I will tell you what I did this spring: I had thirty-two acres of as stiff clay as any in this county, which had been underdrained, and only completed by the middle of April. It lay in such a rough state, and was so wet and soft, that it was almost impossible to put a horse upon it, and I fetched out my good friend Smith of Woolston, and I smashed the whole of it up and made a good tilth in less than a week. I drilled it with oats and barley, and had as good a crop as could be seen in the neighbourhood; and I am fully confident, if I had not had steam, I should not have had a quarter of corn of these thirty-two acres. Now, gentlemen, I am sure I have tried your patience, but I hope the interest you all feel in this most important subject will be my apology for keeping you so long. All honour, then, to the Buckinghamshire farmer, Smith of Woolston, for his indomitable pluck in bringing this system to perfection, and to those public-spirited men, Messrs. John Fowler and Howard, for the patience and skill with which they have succeeded in still further working out this difficult problem.

A discussion ensued, in which

Mr. J. TAYLOR gave the results of steam culture on Sir Anthony de Rothschild's farm at Aston Clinton. They had been at work all the autumn, and found it impossible to use the cultivator in the way it was ordinarily used; and they were using the plough. He would say, use your cultivator to clean your land. But they would find that the cultivator would not supersede the plough; but let them turn over the land as deeply as possible, for the more they exposed the land to the atmosphere the better it would be. He agreed with Mr. Fowler that steam cultivation was not altogether a question of cost. If they once undertook to use steam for the cultivation of the land they would not get the result at once; but he would be bound to say that they could trace for years afterwards land that had been treated by steam. He was pleased to find that Mr. Fowler did not omit to give honour to Mr. Smith, who had done more to develop steam cultivation than any other man. As to difficulties of steam appliances, he did not see any. Sir Anthony's farm was at the top of Aston Hill, and notwithstanding the quality of the land there, there was not a square hole that they could not get at with their implements, whether harrow, or plough, or cultivator. In one place, the engine was 150 feet higher than the implement at work, which he ascertained by the use of a spirit level; and on one occasion by an arrangement of rope they could do an acre an hour. During the short days of winter they worked ten acres a day. But then it required only one operation, and it was with the view of sowing oats in the spring. That was an example of what could be done by steam. They could not perform impossibilities by steam any more than by any other agency; but the fact was, the difficulty of breaking up the land was greatly reduced by the employment of steam, and he had no fear that farmers employing that agency would ever regret it. He hoped never to be obliged to farm otherwise. Indeed, if they got a steamer, there was other work on a farm that could be done by it, such as thrashing and grinding. He dared venture to say he could find employment on a farm for a steam engine every day in the year. He was much amused by the remark of a pedlar who travelled past Aston for twenty years past, that he used to see the scythe flash through the corn; but since they had had steam he did not see it at all, but the crops were better, as was instanced by the fact that he grew four or five quarters of barley per acre on the same land.

Mr. J. W. **Griffin** alluded to the comparison between steam and horse power. If he had a farm like Mr. Fowler's, he would want to buy some useful colts from £20 to £25 each, and wear one out and then sell it for £50. He would not want to lose £6 a-year for four years by his horses, and then they to be useless at last. Mr. Fowler's calculation that a horse would only last four years was scarcely correct.

Mr. W. H. **Rose** would ask both Mr. Taylor and Mr. Fowler whether they did not think the better crops of which they spoke were partly owing to the manuring and high dressing. That was the way to arrive at a correct idea of the relative worth of the two systems.

Mr. **Taylor** said, of course they had used manure and dressing; but there was a great deal of the land on the Aston Hill, that could not be ploughed by horses, which could scarcely drag themselves up some of the steep sides of the hills; and even if they could, a man could not hold the plough there and walk up. He had no hesitation in attributing by far the greater part of the result of the crops to the agency of steam. There was one view of steam power that had not been alluded to—the moral effect. Of all the agencies of civilization there was nothing like steam; and he was safe in saying that it made all connected with it smarter.

Mr. **Rose** asked if Mr. Taylor could not plough the land with horses, on the hills, how did he manage to cart off the crop?

Mr. **Taylor** replied that wheels were very different from dragging a plough.

Mr. J. K. **Fowler** said it was not to be understood that after farmers adopted steam they should keep no horses at all on their farms; for there were certain operations in which horses would always be wanted. But it was not profitable to keep the horses still in the stable, merely because they had a steam engine. Cloverley, for instance, was one of the things for which they might fairly be used for turning over the land. The entire superseding of horses by steam was never intended by Mr. Smith or any of the promoters of steam culture. Looking at the comparison in a pecuniary light, it is immeasurably in favour of steam over horse labour. It was absolutely impossible that all the horses in England could do what the steam-engine could do. There was no invented implement that could go deep enough. There was no invented harness that could move the masses of earth that steam could; and the very method by which the steam plough drove like a sledge-hammer into the soil, not like the dead pull of horses, but the banging of the engine itself on the soil, disintegrated it in a way that no horse labour could effect. He was for smashing up. This was perhaps an exceptional year, and, perhaps, owing to the grass land cultivated, with no frost to kill the grass, the furrow-plough might be advantageously used; but as a rule, he was against the furrow-plough smashing up, and on the broad principle that Mr. Smith had enumerated—that they wanted to get the noxious weeds on the top of the soil, and not to bury them. As had been well hinted, the cost of the steam engine should not be charged to steam ploughing alone; for other work could be done by steam. As to Mr. Griffin's remark about horses, he (Mr. Fowler) once used the same objection to Mr. Smith, but he replied that he was more a grazier than a farmer if he meant to make a profit out of the work of his horses. His horses were intended to do the work of the farm, and not to be pampered and sold for a lot of money afterwards. Perhaps he had overstated the case in saying a horse would not last over four years. As to Mr. Rose's observation about his crops, he could best answer that by asking him how many times he (Mr. Rose), as a judge of that society, had awarded him the silver cup for his steam-cultivated crops? Mr. Mechi once said at a dinner that he never had seen furrows made by horse-power deeper than a wine-glass; and he afterwards took a wine-glass and placed it in the furrow in the ploughing field, and in no case was the furrow deeper. He had heard of people ploughing by horse-power ten inches deep; but he would be glad to go any distance to see it. What he would say was, Let us stick to this principle: whatever is to be obtained, go to steam and have deep cultivation, especially on your heavy clay lands.

A vote of thanks was passed to Mr. Fowler, and a similar compliment having been paid to the chairman, the meeting ended.

OILS AND FATS, AND THEIR EQUIVALENTS AS FOOD FOR STOCK.

At the Athy Farmers' Club, Professor **Cameron** read the following paper. He commenced with some introductory remarks of a general nature, referring to the former and present condition of agriculture in the British Islands, the sources of the supplies of meat, and the probability of keener competition between the foreign and home producer of meat; after which he proceeded as follows: I shall now briefly describe the composition of those animals the rearing of which constitutes no inconsiderable proportion of the business of the Irish farmer. Exclusive of the blood, which contains the elements of all the parts of the body, the animal organism is composed of three distinct classes of substances—nitrogenous, non-nitrogenous, and mineral. All these substances must exist in food. In some kinds of nutriment—milk and wheat-grain, for examples—all these constituents are found; but in others—sugar, for example—but one of them occurs. The nitrogenous part of the carcase embraces the muscles, or lean flesh, the gelatine of the bones, a small portion of the nervous system, and the skin and its appendages—hair, horns, &c. The non-nitrogenous constituents are its fats and oils; and its mineral matter is found chiefly in the bony frame-work. These different constituents are not, however, completely isolated. The mineral matter, no doubt, accumulates in certain parts; but, in small quantities, it is found in almost every part of the carcase; and, although the fat forms a distinct tissue, the muscles of the leanest animal are never free from a sensible proportion of this substance. Albumen, fibrine, and casein are the principal nitrogenous substances found in food: hence they are termed "flesh" or "muscle-formers," because they alone are capable of repairing the waste of the muscular tissues of animals. The fat and oil of animals are derived from vegetable fats and oils, or from certain non-nitrogenous substances which are capable of being converted into fat in the animal body, such, for example, as starch, sugar, and vegetable fibre. The constituents of food which form fat are termed "fat-formers," and sometimes "heat-givers" or "respiratory elements," because it is believed that their slow combustion in the animal body is the cause of its high temperature. The mineral elements of the carcase are furnished chiefly by those food-substances which contain nitrogen, and which, therefore, are flesh-formers. The whey of milk is rich in these; but they do not occur in pure butter, in starch, or in sugar. Fat is a much more abundant constituent of the animal body than is generally supposed. That this substance should constitute the greater part of the weight of an obese pig seems probable enough; but few are aware that even in a lean sheep there is fifty per cent. more fat than lean flesh. For a very accurate knowledge of the relative amounts of fatty, lean, and mineral portions of the carcases of animals we are indebted to Liebig, Lehman, but more especially to Lawes and Gilbert. The investigations, in relation to this point, of Lawes and Gilbert I cannot avoid characterising as one of the most laborious, and apparently most trustworthy, on record. The mere statement of the results occupies no less than 187 pages of one of the huge volumes of the "Transactions" of the Royal Society. From a large number of animals on which feeding experiments were being conducted ten individuals were selected. These were a fat calf, a half-fat ox, a moderately fat ox, a fat lamb, a store sheep, a half-fat old sheep, a fat sheep, a very fat sheep, a store pig, and a fat pig. These animals were killed, and the different organs and parts of their bodies were separately weighed and analyzed. The results were that, with the exception of the calf, all the animals contained more fat than lean. The fat ox and the fat lamb contained three times as much fat as lean flesh, and the proportion of the fatty matters to the nitrogenous constituents of the carcase of the very fat sheep was as 4 is to 1. In the pig the fat greatly preponderated over the lean; the store pig containing three times as much and the fat pig five times as much fat as lean. That part of the animal which is consumed as food by man is termed the *carcase* by the butcher, and contains by far the greater portion of the fat of the animal. The *offal*, in the language of the butcher, constitutes those parts which are not commonly consumed as human food; at least, by the well-to-do classes. In calves, oxen, lambs, and sheep the offal embraces the skin, the feet, and the head, and all the internal organs, excepting the kidneys and their fatty envelope. The offal of the pig is made up of all the internal organs, excepting the kidneys and kidney fat. It is the relative proportion of fat in the carcases analyzed by Lawes and Gilbert that I have stated to you; but as the nitrogenous matters occur in greatest quantity in the offal, it is necessary that the relative proportion of the constituents of the body, taken as a whole, should be considered. On an average, then, it will be found that a fat, fully-grown animal will contain 49 per cent. of water, 33 per cent. of dry fat, 13 per cent. of dry nitrogenous matter (muscles separated from fat), hide, &c., and 3 per cent. of mineral matter. In a lean animal the average proportions of the various constituents will be 54 per cent. of water, 25½ per cent. dry fat, 17 per cent. of dry nitrogenous substances, and 3½ per cent of mineral matter. As fat forms so large a portion of the body, it is evident that the part it plays in the animal economy must be a most important one. Let me state to you the opinion which prevails amongst scientific men as to its physiological functions—an opinion or theory which, at the outset, I may remark, was originated by Liebig. According to this theory, the food of animals includes two distinct kinds of substances —*plastic* and *non-plastic*. The plastic materials are composed of carbon, hydrogen, oxygen, nitrogen, and a little sulphur and phosphorus. Albumen, fibrine, and casein are plastic elements of nutrition; they form the lean flesh, or muscles, the membranes and cartilages, the gelatine of the bones, the skin, the hair, and, in short, every part of the body which contains nitrogen. The non-plastic elements of nutrition include fat, oil, starch, sugar, gum, and certain constituents of fruits, such as pectine. All of these substances—and of each kind there are numerous varieties—are capable of conversion, in the animal mechanism, into fat and oil. The non-plastic food substances do not contain nitrogen; hence they are commonly termed non-nitrogenous elements. The oily and fatty matters contain a large proportion of carbon, their next most abundant component is hydrogen, and they contain but little oxygen. Unlike the plastic elements, they are altogether destitute of sulphur and phosphorus. The starchy, saccharine, and gummy substances are composed of the same elements as the fatty bodies; but they contain a higher proportion of oxygen. According to Liebig, fat, unlike albumen, does not possess an organized structure. It is devoid of vital properties, and is merely in a state of mechanical admixture with the tissues—from which, indeed, it may be removed by mere pressure, or by solvents without in the slightest degree affecting the structure of these parts. If this view of the nature of fat be correct, it is evident that it no more participates in the life of an animal than does the water, which forms the greater portion of the weight of its body. The fatty constituents of the body undergo a slow process of combustion, by which heat is produced; and just in proportion as the temperature of the medium in which the animals live is low, so will there be a greater demand for the fat-forming or heat-giving food. I have stated that the fat of animals greatly exceeds their lean flesh. This fact is suggestive of many important questions: What relation is there between the composition of an animal and that of its food? Should an animal whose body contains three times as much fat as lean flesh be supplied with food containing three times as much fat-formers as muscle-producers? To these questions there is some difficulty in replying. There is a relationship between the composition of an animal and that of its food; but the relationship varies so greatly that it is, at present at least, impossible to determine with accuracy the quantity of fat-formers necessary to produce a given weight of fat in animals, taken *in globo*. If, however, we deal with a particular animal, placed under certain conditions, it is then possible to ascertain the amount of fat which a given weight of non-plastic food will produce. Lawes and Gilbert found that oxen stored up in permanent increase of fat 10 per cent. of the fat-formers supplied to them; sheep, 12 per cent., and pigs no less than 20 per cent. The amount of flesh-formers stored up in permanent increase is far less than in the case of the fat-formers; and it appears to me that too great importance has been given to the presence of large amounts of nitrogenous or plastic ingredients in food substances. Whilst it is certain that neither nerves nor muscles can be elaborated exclusively out of fat, starch, sugar, or other non-nitrogenous substance, it is almost equally clear that fat may be formed out of nitrogenous tissue. The quantity of fat, however, which is produced in the animal mechanism from purely nitrogenous food appears to be relatively very small. No animal is capable of subsisting solely on muscle-forming materials, no matter how abundantly supplied. The food of the carnivora contains a large proportion of fat, and the nutriment of the herbivora is largely made up of starch and other fat-formers. Dogs, geese, and other animals fed exclusively on albumen or white of egg rapidly decreased in weight, and after presenting all the symptoms of starvation, died in three or four weeks. The fat of the bodies of the carnivora is almost entirely formed—and probably with little if any alteration—from the fatty constituents of their food. Herbivorous animals, on the contrary, derive nearly all their fat from starch, sugar, gum, cellulose, and other non-nitrogenous, but not fatty materials. Although starch is convertible into fat, it is not to be understood that a pound-weight of one of these bodies is equivalent to an equal quantity of the other. During the conversion of starch into fat, the greater number of its constituent atoms is converted into water and carbonic-acid gas. The greater number of the more important metamorphoses of organised matter which take place in the animal organism is the result of either oxidation or fermentation: in the conversion of starch or sugar into fat or oil, both of these processes, it is stated, take place: a portion of the hydrogen is converted by oxidation into water, and by fermentation carbonic-acid gas is formed, which removes both oxygen and carbon. Perhaps in the formation of fat fermentation is alone employed, a portion of the oxygen being removed as water, and another portion as carbonic acid. The chief difference between the ultimate composition of starch and fat is, that the latter contains a much larger proportion of carbon and hydrogen. The knowledge of the exact quantity of starch required for the production of a given amount of fat is of importance in enabling us to estimate the relative values of both substances. Certain difficulties stand in the way of our acquiring an accurate knowledge on this point: not only are there several distinct kinds of fat, but the precise formula, or atomic constitution, of each is as yet veiled in doubt. Three fats are common to man, the lower animals, and vegetables: these are stearine, margarine, and oleine. The relative proportions of these vary in the case of esch species of animal, and even in different individuals of the same species. The composition of each fat does not, however, vary to any great extent. This fact, together with certain other considerations, have led chemists to assume that two-and-a-half parts of starch are required for the production of one part of animal fat. Grape-sugar and the pectine bodies —substances which form the great bulk of the food of the herbivora—contain more oxygen and hydrogen than exist in starch, and, consequently, are not capable of forming so large an amount of fat as starch is. We are, I think, very close to the truth when we set down 2½ parts of starch, 2¾ parts of sugar, or 3 parts of pectine bodies, as being equivalent to one part of fat or oil. We now turn to a most important question, which the study of the facts I have adduced must suggest to the inquirer's mind: What becomes of the ninety per cent. of the weight of the non-nitrogenous constituents of the food of the sheep, and of the eighty per cent. of that of the nutriment of the pig, which they consume, and do not store up? I have already partly answered this question. This portion of the food is chiefly expended in the production of the heat with which the high temperature of the animal's body is maintained. Part of it, no doubt, passes unchanged through its body, either owing to the indigestibility or to its being given in excess. The quantity of non-nitrogenous matters consumed by a man is influenced greatly by the temperature of the air which he habitually breathes; and also, but to a far less extent, on the nature of the artificial covering of his body. There may be other conditions at present unknown to us, but these are amongst the chief ones. Now, as there is sufficient reason to lead us to believe that the consumption of carbonaceous food by the lower animals is influenced in the same way by the temperature of the medium in which they exist, the question naturally suggests itself, would it not be cheaper to maintain the heat of the animal by burning the carbon of *cheap* coal or turf outside its body, than by consuming the carbon of *costly* fat within it? The answer to this question is not so simple as at first sight it appears to be. In considering it, we must guard against the mistakes into which pseudo-scientific men so often fall. We must not, with them, consider that because a stone weight of carbon, *as coal*, cost but *a penny*, whilst an equal weight of the same element in *starch* costs *twenty pence*, that heat may be furnished to a fattening animal twenty times cheaper by the combustion of coal than by that of starch. No doubt, the amount of heat evolved by the conversion of a pound weight of carbon into carbonic acid is the same, whether it be a constituent of starch or of coal; but the application of the heat so produced is less under our control in the latter case. *All* the heat evolved during the combustion of the starch within the animal's body is made use of; whilst a very large proportion of that developed by the combustion of coal in a furnace cannot in practice be applied to the purpose of heating the animal's body. It is only the handiwork of the Creator which is perfect, and no machine constructed by the skill of man, for the direction of force, can rival that wondrous heat-producing, force-directing mechanism—the animal organism. According to Dumas, the combustion of about 2½lbs. of carbon in a steam-engine is required to generate sufficient force to convey a man from the level of the sea to the summit of Mont Blanc; but a man will ascend the mountain in two days, and burn in his mechanism only half a pound of carbon. There is no machine in which heat and force are more completely made available than the animal organism; and were it not—thanks to the influence of antediluvian sunshine—that the carbon of fuel in these countries is so very much cheaper than the carbon of food, there is no doubt but that the cheapest mode of keeping an animal warm would be to allow it to burn its carbon within its body. As the matter stands, however, there is no question as to the advisability of keeping fattening animals in a warm place. If the temperature of the stall be equal to that of thea nimal"s body there will be less food consumed in the increase of its fat, because less of the fat-forming materials will be expended in the production of heat. In this sense, therefore, heat is an equivalent to food, but only within certain limits. No matter how high the temperature of the air may be, heat will be developed within the animal body. Why it should be evolved under such circumstances is not very clear. Perhaps it is partly owing to the fact that animal substances are bad conductors of heat, and that, consequently, an animal, if solely dependant upon the heat of the sun would not have its deep-seated organs maintained by it at a sufficiently high temperature. I do not know that the experiment has ever been made; but it would be worth the trouble to ascertain whether the centre of the heart of a dead animal has the same temperature as that of the air when the latter is, say, 90 deg. or 100 deg.: I do not think it has. Perhaps the combustion of carbon in the animal organism is involved in the production of nervous force, and that the evolution of heat is an incidental action. Be the cause what it may, it is quite certain that heat is developed in large quantity within the animal body, independently of the temperature of the air. There is, therefore, no object attained by having the stalls heated beyond 70 deg. or 80 deg. Indeed, it is to be questioned whether or not stalls artificially heated are ever properly ventilated. If they be not, the health of the animal will suffer, and its appetite—so essential a point in fattening stock—will become impaired. On the whole, then, I think we may safely eliminate from the facts I have detailed the following conclusions: Firstly, that animals, when fattening, should be kept at a temperature not under 70 deg. nor above 90 deg. Fahrenheit; secondly, that the mode of heating must be such that there is as little wasteful combustion of fuel as is possible under the circumstances; and, lastly, that no motives of economy of fuel should prevent the feeding-places from being thoroughly ventilated. The *sheltering* of animals is perhaps of more importance than the heating of their bodies by the combustion of fuel. Nothing lowers the temperature of the surface so rapidly as a cold wind. Captain Parry, one of the explorers of the arctic regions, states that his men, when well clothed, suffered no inconvenience on exposure to the low temperature of 55 deg. below zero, provided the air was perfectly calm; but the slightest breeze, when the air was at this temperature, caused the painful sensation produced by intense cold. I could adduce the experience of many practical men in favour of the plan of affording shelter to animals, but more especially to those kept in situations much exposed to winds. Mr. Nesbit relates a case bearing on this point, which is so instructive that I shall repeat it to you: A farmer in Dorsetshire put up twenty or thirty sheep, under the protection of a series of upright double hurdles, lined with straw, having, as a sort of roof or lean-to, a single hurdle, also lined with straw. A like number of sheep of the same weight were fed in the open field, without shelter of any kind. Each set was fed with turnips *ad libitum*. The result was that those without shelter increased in weight 1lb. per week for every sheep; whilst those under shelter, although they consumed less food, increased respectively 3lb. per week. Having now shown the importance of fats and their equivalents in the nutrition of stock, I shall bring under your notice a few of the more important food-stuffs which, in my opinion, are chiefly valuable for their non-plastic elements. Within the last quarter of a century great attention has been given to the feeding of stock; and the effects are observable in the improved quality and greatly-increased weight of the animals. In the year 1839 the average weight of the horned beasts from Ireland sold in the London market was only 640lb., whereas at the present time their average weight is about 740lb. This remarkable advance in the production of meat is in great part due to the cattle being more liberally supplied with food, and that, too, of a more concentrated nature. The practice of feeding animals destined for the shambles exclusively on roots, containing 90 and even 95 per cent. of water, which once prevailed so generally in this country, is now limited to the farmsteads of a few old-fashioned feeders; and the necessity for the admixture of highly nutritious aliment with the bulky substances which form the staple food of stock is almost universally recognised. Of concentrated foods used for fattening stock none stands higher in the estimation of the farmer than linseed-cake, although it appears to me that the price of the article is somewhat too high in relation to its amount of nutriment, and that corn, if its price be moderate, is a more economical food. Straw, turnips, and mangels form the bone and sinew of the animals, and enable them to carry on the vital operations which are essential to their existence. Oilcake and similar foods are supplemental, and contribute directly to the animal's increase, so that their nutritive value appears to be greater than it really is. If an animal were fed exclusively upon oilcake, the greater part of it would be appropriated to the reparation of the waste of the body, and the rest would be converted into permanent flesh—the animal's "increase." The addition of straw would produce a still further increase in the animal's weight—an increase which would be directly proportionate to the amount of straw consumed. Thus it will be seen that, whatever the staple food may be, it will have to sustain the life of the animal, and will be principally expended for that purpose; whereas the supplemental food will be chiefly, if not entirely, made use of in increasing the weight of flesh. To me it appears manifestly incorrect to consider, as feeders practically do, the value of linseed-cake to be seven or eight times greater than that of oat-straw, and twenty times greater than that of roots. Let us assume the case of an animal fed upon roots, straw, and oilcake. Seventy-five per cent. of its food, say, is expended in repairing the waste of its body; and twenty-five per cent. is stored up in its increase. Now, if the three kinds of food contributed proportionately to the reparation of the body and to its increase, the roots and straw would be found to possess a far higher nutritive value, in relation to the oilcake, than is usually ascribed to them. But it may be asked why straw, if it be relatively a much more economical feeding-stuff than oilcake, is not employed, to the complete exclusion of the latter? Simply because animals thrive better on a diet composed partly of bulky, partly of concentrated aliments. This much, however, is certain—that animals can be profitably fed upon roots and straw; whilst it is equally certain that to feed them upon oilcake alone (assuming them to thrive upon such a diet) would entail a very heavy loss upon the feeder. At the same time, it must be admitted that the oil of the linseed-cake exercises, in all probability, a beneficial influence on the digestion of the animal, so that the nutritive value of the article may be somewhat higher than its mere composition would indicate. The quantity of oilcake given to fattening stock varies from 2lbs. to 14lbs. per diem. I believe there is no greater mistake made by feeders than that of giving excessive quantities of this substance to stock. If their object in so doing be to enrich their manure-heap, they would find it far more economical to add the cake directly to the manure—or rather of adding rapecake to it, for this variety of cake is fully as valuable for manurial purposes as the linseed cake, and is nearly 50 per cent. cheaper. A larger quantity of oilcake than 7lbs. daily should not be given to even the largest-sized milch cows or fattening bullocks. If a larger amount be employed it will pass unchanged through the animal's body. Young cattle may with advantage be supplied with from 1 to 3lbs., according to their size, and from ½lb. to 1lb. will be a sufficient quantity for sheep. Intelligent feeders have remarked that cattle which had been always supplied with a moderate allowance of this food fattened more readily upon it during their finishing stage than did stock which had not been accustomed to its use. The great drawback to the use of linseed cake is the liability of the article to be adulterated. The sophistication is sometimes of a harmless nature—if we except its injurious effect on the farmer's pocket; but not unfrequently the substances added to the cakes possess properties which completely unfit them to be used as food. Amongst the injurious substances found in linseed and linseed-cake I may mention the seeds of the purging flax, darnel, spurry, corn-cockle, curcus beans, and castor-oil beans. Several of these seeds are highly drastic purgatives, and they have been known to cause intense inflammation of the bowels of animals fed upon oilcake, of which they composed but a small proportion. Amongst the adulterations of linseed cake which lower its nutritive value without imparting to it any injurious properties are the seeds of the cereals and the grasses, bran, and flax-straw. Little black seeds belonging to various species of *Polygonum* are very often present in even good cakes; they are very indigestible, but otherwise are not injurious. Rapecake is stated to be occasionally used as an adulterant of the more costly linseed, but I have never met with an admixture of the two articles. The only way in which a correct estimate of the value of linseed cake can be arrived at is by a combined microscopical and chemical analysis; but as the feeder is not always disposed to incur the cost of this process, he should make himself acquainted with the characteristic of the genuine cake, in order to be able to discriminate, as far as possible, between it and the sophisticated article. I shall indicate a few of the more prominent features of cake of excellent quality, and point out a few simple and easily-performed tests which may serve to detect the existence of gross adulteration. Good cake is hard, of a reddish-brown colour, uniform in appearance, and possesses a rather pleasant flavour and odour: the adulterated cake is commonly of a grayish hue, and has a disagreeable odour. A weighed quantity of the cake—say 100 grains—in the state of powder should be formed into a paste with an ounce of water. If it be good the paste will be light-coloured, moderately stiff, and endowed with a pleasant odour and flavour. If the paste be thin, the presence of bran, or of grass seeds, is probable; the latter are easily seen through a manifying glass—indeed, most of them are readily recognisable by the unassisted eye; they may therefore be picked out, and their weight determined. Sand—a frequent adulterant—may be detected by mixing a small weighed quantity of the powdered cake with about twelve times its weight of water, allowing the mixture to stand for half-an-hour, and collecting and weighing the sand which will be found at the bottom of the vessel employed. If there be bran present it will be found lying on the sand, and its structure is sufficiently distinct to admit of its detection by a mere glance. There are a great variety of linseed cakes in the market, of which the home-made article is the best. On the continent, the oilseeds are subjected to the action of heat in order to obtain from them a greater yield of oil: their cakes, therefore, contain less oil, and their flesh-forming principles are less soluble, in comparison with British linseed cake. Next to our home-made oilcakes, the American is the best. Indeed, I have met with some American cakes which were equal to the best English. The use of rapecake was limited almost completely to the fertilizing of the soil until the late Mr. Pusey, in a paper published in the tenth volume of the "Journal of the Royal Agricultural Society of England," advocated its employment as a substitute for the more costly linseed cake. The recommendation of this distinguished agriculturist has not been disregarded; and, since his time, the use of this cake as a feeding stuff has been steadily on the increase, and at the present time its annual consumption is not far short of 50,000 tons. In relation to the nutritive value of rapecake, there exists considerable diversity of opinion. Certain feeders assert that animals fed upon it go out of condition; others, whilst admitting that stock thrive upon it, maintain the economic superiority of linseed cake; whilst a third set believe rapecake to be the most economical of feeding stuffs. How are we to account for these great differences of opinion—not amongst theorists, be it observed, but amongst practical men? It is not difficult to explain them away satisfactorily. Rapecake and linseed cake are about equally rich in muscle and fat-forming principles; and, supposing both to be equally well flavoured, there can be no doubt but that one is just as nourishing as the other. But it so happens that a large proportion of the rapecake which comes into the British market possesses a flavour which renders it very disagreeable to animals. One variety—namely, the East Indian—is almost poisonous, whilst the very best kind is slightly inferior to linseed cake. Now, if an experiment with a very inferior kind of rapecake and a good variety of linseed cake were tried, who can doubt but that the results would be very favourable to the latter article? Mr. Callan, of Rathfarnham, Co. Dublin; Mr. Bird, of Renton Barns, and some other feeders who found rapecake to be worse than useless, experimented in all probability with an adulterated article, for they do not appear to have had the cake analyzed. On the other hand, those whose experience with rapecake has proved favourable must have employed the article in a genuine state, moderately fresh, and well-flavoured. It is noteworthy that amongst the advocates for the use of rapecake as a substitute (partly or entirely) for the more costly linseed cake are to be found the most successful feeders in England and Scotland. Horsfall, Mechi, Lawrence, Bond, Hope, and many other feeders of equal celebrity, have assigned to rapecake the highest place, in an economic point of view, amongst the concentrated feeding stuffs. Mr. Mechi says: "I invariably give to all my animals as much rapecake as they choose to eat, however abundant their roots or green food may be. It pays in many ways; and not to do this is a great pecuniary mistake. Even when fed on green rape, they will eat rapecake abundantly. My cattle are now under cover, eating the steamed chaff, rapecake, malt coombs, and bran, all mixed together in strict accordance with the proportions named by Mr. Horsfall, in the 'Journal of the Royal Agricultural Society,' vol. xviii., p. 150, which I find by far the most profitable mode of feeding bullocks and cows." Mr. Hope, of Edinburgh, states that rapecake is the best substitute for turnips, and that, excepting cases where spurious kinds had been used, he never knew bullocks or milch cows to refuse it. This gentleman states that it is best given in combination with locust beans, or a mixture of locust beans and Indian corn, and suggests the proportions set down in the tables as the best adapted for lean cattle; but I think about two-thirds of the quantities would be quite sufficient.

	Feed per week.	Per week.	
	lbs.	s.	d.
Rapecake at £15 15s. per ton	8 ...	2	10½
Do. Do.	10 ...	3	7
Mixture of two-thirds rapecake and one-third locust beans, £6	8 ...	3	0
Do. Do. Do. ...	10 ...	3	9
Rapecake, locust beans, and Indian corn in equal proportions	8 ...	3	2½
Do. Do. Do. ...	10 ...	3	11¼

An intelligent Scotch dairy farmer bears the following testimony in favour of this cake: "I have tried peas-meal, bean-meal, oatmeal, and linseed cake, and after carefully noting the results, I consider rapecake, weight for weight, at least equal to any of them for milch cows; and, if I give the same money value for each, I get at least one-third more produce, and the butter is always of a very superior quality. Two years ago, I took some of my best oats (41lbs. per busbel), and ground them for the cows; and although I was about one-third more expense, I lost fully one-third of the produce that I had by using rapecake. I always dissolve it by pouring boiling water on it, and give each cow 6lbs. daily. I have tried a larger quantity, and found I was fully repaid for the extra expense. I generally use it the most of the summer, but always during the spring months. A number of my neighbours who have tried it all agree that it is the best and cheahest feed for milch cows they have used." The best kinds of rapecake come from Germany and Denmark. When fresh, and of a pale green colour, these foreign cakes are tolerably well flavoured, and are but slightly inferior to good linseed cake. Most varieties of this cake, however, contain a small proportion of an acrid matter, which often renders tham more or less distasteful to stock, more particularly to cattle. This substance may be rendered quite innocuous by steaming or boiling the cake. Either of these processes will also, according to Mr. Lawrence, destroy the disagreeable flavour which mustard-seed—a frequent adulterant of rapecake—confers upon that article. Molasses, or treacle, is an excellent adjunct to the cake, as it serves in a great measure to correct its somewhat unpleasant flavour. Carob or locust beans answer, perhaps, better the same purpose. It is better, as a general rule, to give less rapecake than linseed cake, unless the pale green kind to which I have referred is obtainable: that variety may be largely employed. The animals should be gradually accustomed to its use. At first—in the case of bullocks—they should get only 1 lb. per diem, and the quantity should be gradually increased to about 4 lbs.; but I would not advise, under any circumstances, a larger daily allowance than 5 lbs. Given in moderate amounts it will, supposing it to be of fair quality, be found to give a better return in meat than almost any other kind of concentrated food; and, what is of great importance, it will not injuriously affect the animal's health. Our experience of the use of rape cake, says Mr. Lawrence, thus used (cooked) extends over a period of ten years of feeding from 20 to 24 bullocks annually. We have not had a single death during that period, and the animals have been remarkably free from any kind of ailment. Rape cake of good quality possesses a dark green colour (the greener the better), and when broken exhibits a mottled aspect—yellowish and dark brown spots. Sometimes a tolerably good specimen has a brownish colour; but the German and Danish cakes are always of a greenish hue. The odour is stronger than that of linseed cake, and differs but little from that of rape oil. The only serious adulteration of rape cake is the addition to it of mustard seed—sometimes accidentally, less frequently, as I believe, intentionally. This sophistication admits of easy detection. Scrape into small particles about half-an-ounce of the cake, add six times its weight of water, form the solid and liquid into a paste, and allow the mixture to stand for a few hours. If the cake contain mustard, the characteristic odour of that substance will be evolved, and its intensity will afford a rough indication of the amount of the adulterant. As some specimens of genuine rape cake possess a somewhat pungent odour, care must be taken not to confound it with that of mustard; but, indeed, it is not difficult to discriminate the latter. The paste of rape cake which contains an injurious proportion of mustard has a *very* pungent flavour. Cottonseed cake is one of the most valuable feeding-stuffs that have come into use of late years. At present, owing to the late internecine war, it is rather scarce, but there is no doubt of its becoming, sooner or later, a favourite with the British feeder. The chemical composition of this cake shows it to be slightly superior to the best linseed cake, and as its price is much lower than that of the latter, it may be fairly considered a more economical food. These remarks apply only to the shelled or decorticated seed-cake, for the article prepared from the whole seed is of very inferior composition, and should never be employed. The use of the cake made from the whole seed has proved fatal in many instances—not from its possessing any poisonous quality, but in consequence of its hard, indigestible husk, accumulating in, and inflaming, the animal's bowels. The composition of this cake varies somewhat. The following analysis of a sample from one of the western states of North America, imported by Messrs. G. Seagrave and Co., of Liverpool, was made by me: the specimen was one of the best ever imported into England—

Water	8.20
Oil	10.16
Albuminous, or flesh-forming principles	40.25
Gum, sugar, &c.	21.10
Fibre	9.23
Ash (mineral matter)	11.06
	100.00

The purchaser of cottonseed cake should be certain that it is not old and mouldy, which is frequently the case. The recently prepared cake has a very yellow colour, which becomes fainter as the cakes become older. Freshness is a very desirable quality in every description of cake. I have known animals to have a greater relish for, and thrive better upon, home-made linseed cake than upon cake of foreign manufacture, of superior composition, but of greater age. Rape cake, however, should not be used when too fresh, owing to its acrid flavour, which time partly removes. Palm-nut meal is an article which has recently been introduced as food for stock. I have recently examined a specimen of it sold by Messrs. Wight, of Eustace-street, Dublin, and found it is extremely rich in nutritive elements. Except linseed oil and the seeds of a few oil-bearing plants occasionally given to stock, palm-nut meal is the richest source of oil with which I am acquainted. It contains about 27 per cent. of fatty substances, 15 per cent. of flesh-forming elements, and about 36 per cent. of digestible non-nitrogenous matters. I would strongly recommend it as a suitable food for fattening pigs; but it is also an excellent food for all kinds of stock, and at its present price I look upon it as the cheapest source of ready-formed fatty food. Molasses constitute a useful food, more especially as a favouring adjunct. It furnishes only fat-forming matter, in which respect 2½lbs. of it are about equivalent to a pound of oil or fat from linseed cake, palm-nut meal, or similar sources. Gentlemen, I have to thank you for the attentive hearing which you have given to this paper, and trust that I have not altogether idly occupied your time.

In reply to Rev. Mr. Bagot, Professor Cameron stated that the price of palm-nut meal in Dublin was about £7 per ton.

Mr. Douglas stated that he had tried rape cake with pigs, but they got sick on it. His cattle took it as well, but they were going to die.

Professor Cameron: They don't like it at first. Rape should be used when not too old.

Mr. Robertson: I was always under the impression that it was better than stale, and used in conjuction with oil.

Mr. Bulwer said he had some in an out-house for nine months, and after that time the cattle, which refused to eat it when fresh, devoured it with a will.

Professor Cameron said at first the rape cake had a rancid taste, but when cooked with steam it was quite bland.

Some observations were made as to the effect which cottonseed and oilcake had upon milk.

Mr. Robertson thought the quantity would be better than the quality.

Professor Cameron said he had had some experience of milk as an analyst; but, no matter what the food on which the cattle had been fed, the quantity of solid matter in the milk was much the same; but, of course, there was a difference in the quantity and quality of the cream.

Mr. **Bulmer** asked how far were people justified in accepting the results of any one analysis.

Professor **Cameron** stated that chemical analyses gave certain facts which might, in most instances, be relied upon. The learned professor repeated from his paper hints as to how genuine rape cake might be discerned. It was always known by its colour.

Mr. **Davidson** said he had given the highest price for cake in Athy, and he found it not to succeed at all.

Professor **Cameron** alluded to the great feeding properties of straw and turnips; but in this country corn was allowed to get over-ripe. When the straw began to get yellow an inch or so below the ear, it was then ripe, even should the remainder of the straw be green. A vast quantity of the straw was rendered valueless by allowing it to get too ripe.

Mr. **Davidson** said he was always for giving straw and turnips to cattle: there was nothing better.

Mr. **Butler** mentioned that at Parsonstown, in the King's County, the people bought all the rape cake they could, and sowed potatoes on it.

Mr. **Davidson**: They do perfectly right; it is fit for nothing else.

Mr. **Robertson** did not think so. His lambs never throve so well as on rape cake.

Professor **Cameron** alluded to the fatting properties of molasses.

Rev. Mr. **Bagot** said the same might be said of the locust bean.

Mr. **Butler** proposed and Mr. **Rawson** seconded a vote of thanks to Professor Cameron, which was passed with acclamation.

THE HERDS OF GREAT BRITAIN.

Chapter LIII.

THE UPTON AND CALKE ABBEY.

Those who roam through the cattle-ranks at the Royal or Islington, and set down the two or three Longhorns as mere herd-relics of the era of Hilpah and Shallum, which may serve as foils, and nothing more, for their more fashionable neighbours, should bend their wayward steps to the Sparkenhoe, in September. Bingley Hall and Smithfield Club writers may affect to despise them; but at this most sociable of country carnivals, where men-servants and maid-servants, stockingers and shepherds, wool and wheat, donkeys and sheep-dogs, and every production of the farm, living and vegetable, are had in honour, the despised ones exalt their horn. The show lies in the centre of the four counties which have been their home since the Shorthorn drove them from the North; and they occasionally take an honourable revenge upon their extirpators, by beating them for the head prize of the meeting. Mr. Bakewell and his bull Twopenny have always been regarded as their great improvers; but Mr. Webster, of Canley, near Coventry, and Sir Roger Gresley, of Drakelow, had pioneered the way in the Midlands. Three of the counties are thus accounted for; and in 1771, four-and-twenty years before Bakewell died, Dr. Johnson met with what, judging from the price he mentions, must have been Longhorns, at his host's, Dr. Taylor, of Ashbourne, Derbyshire. He thus speaks, of the herd of the Doctor (who lived to read the funeral service over him): "*Let not the barren name of The Peak terrify you: I have never wanted strawberries and cream. The great bull has no disease but age. I hope in time to be like the great bull.*"

The efforts of the breeders to bring them up to the mark had full fruition at the Rollright sale, near Shipston-on-Stour, A.D. 1791. In Mr. Fowler's eyes, Bakewell's Twopenny had been their Alpha and their Omega; and the run on the blood of Shakespeare and Nell out of Old Nell by Twopenny, brought the average up to £85 2s. 3d., sucking calves included, for fifty. Mr. Stone and Mr. Buckley, the great Leicester breeders, got Garrick and Washington at £215 5s. each; Brindled Beauty, by Shakespeare out of his own dam, made the top price, £273; and Nell's produce of eight seasons realised more than 1,000gs. A priced catalogue, "signed R. Parry," was subsequently published, with a preface. There is a laborious flatulence about it, which suggests that he had been trying to imitate the sonorous periods of the chronicler of "the great bull," and perished mentally in the attempt. "People might have been excited," he says, "by competition, or encouraged by coincident opinions, to exceed their intentions. This may be termed a capricious bravery, or implicit confidential boldness, resulting from the judgment or conduct of their competitors; but where, as at this sale, most of the cows and many of the bulls might have been resold on the spot at considerably higher prices, and I believe none repurchased at their first price, no such imputation of misconduct can apply." He then adds, as the kernel of the whole, "Mr. Fowler's conduct remains an example for imitation for ever. He did not die insolvent, as his abstract property was more than the produce of the sale."

Mr. Fowler's deepest regret seems to have been the selling of three Twopenny heifers, in 1771, to a Mr. Guy, who would only let him have one of them—to wit, Painted Lady—back again. Mr. Paget of Ibstock's sale was in the November of '93. "The Dishley one-horned bull," "the Quorndon bull," "and "the Hampshire bull" had all a share in making his herd; and Shakespeare, bred by Mr. Fowler, was knocked down for 400gs.

> "Tiger! Tiger, burning bright
> In the forests of the night!"

was a couplet of later years' growth; but it was applicable enough to what cattle-breeders consider the dark ages, as 700gs. was offered and refused for a bull of that name. Mr. Paget was also well-known in the land as one of Bakewell's most intellectual disciples, and £62 apiece was made for a pen of his Leicester theaves. Mr. Prinsepp's of Croxall's sale, in 1811, was another red-letter day for Longhorns. A second Shakespeare had set no clownish mark on the Lupin sort, as three cows averaged £217, and sixty lots in all, £60 11s. 2½d. Here the record of great sales ended, and the Durhams moved to the front. Just two-thirds of a century after the first sale sixty-eight were placed in the ring at Rollright once more, and 44gs. for a heifer in calf was the "crowning mercy" of the day.

Although their breeders are now few in number, and have no high prices to beckon them on, they are a very devoted band. Colonel Inge has certainly "drooped and turned aside" of late by using a shorthorn bull; but Sir John Crewe, on the other hand, has abjured shorthorns, which flourished at Calke Abbey both in his father's and grandfather's time. The present baronet is not alone in his Derbyshire allegiance, as Mr. Cox, M.P., of Spondon Hall, inherits to the full the tastes which made his Brailsford kinsman speak up to some purpose on the Rollright day. Mr. Tomlinson, of Southward, also breeds pretty extensively, and many of his bullocks have been purchased and shown successfully by Mr. Faulkener, of Bretby. Mr. Warner, of Weston Hill, keeps up the Warwickshire charter with a herd of a hundred head and eighty years' standing; and so do Messrs. Satchell of Knole, Mr. Moore of Knole, and Mr. Twycross of Canley; while the Kenilworth Chase herd can make good the claims of long descent through Mr. Jackson and Mr. Burbery of Wroxhall's herds, of which it is the successor. Mr. Shaw, of Fradley, and Mr. Brown, of Farewell, represent Staffordshire along with Colonel Inge; and in the county of their more special adoption Mr. R. H. Chapman and the Messrs. M. & N. Taverner of Upton, Mr. W. Berry of Stoke Golding, Mr. J. Godfrey of Wigston Parva, near Hinckley, and Mr. A. Brickwell of Sutton Cheynel Hall, are its six and only herd owners. The Hon. M. W. B. Nugent once bred them extensively at Higham Grange, near Hinckley, and won Royal prizes, both at Bristol and Shrewsbury; and his brother, the Hon. A. F. Nugent, of Pallas Tynagh, Co. Galway, is labouring to give the sort a local habitation and a name once more, in a land which is pretty nearly Booth from one end to another.

The grandfather of the present Mr. Chapman began his herd career in 1756, and (eleven years after his entry on the farm) did his best day's work by hiring the infallible Twopenny. He then used his own bulls for thirty years, and by crossing out with Prinsepp's of Croxall and Green's of Odstone Hill, earned Bakewell's praise, that "George Chapman has a capital herd." Washington (by Shakespeare, from the Bow-horned Cow), Mr. Buckley's Rollright purchase, was also a bull which he greatly fancied. The herd was taken on at his death, in 1802, by his son, Samuel, who was in turn succeeded in 1854, at Upton, by his son, the present tenant. It is, we believe, a circumstance which has hardly a parallel that father and son should hold one farm for 109 years. The late Mr. Chapman was very choice in his selection of bulls; he leant principally to Astley's of Odstone, Prinsepp's of Croxall, and Fox of Newland's blood, and dipped deep four years in succession into Marquis of Exeter, a Royal prize bull of his own breeding. This was in 1846-48, and in 1850 Lord Windsor, afterwards the first prize bull at Windsor, took it up; and so we come on through Warrior, and Mr. Burbery's and Mr. Fletcher's bulls, Rollright (bred by Mrs. Baker), and Warner's Sir Richard, to Old Sparkenhoe, another Royal first, Lord Curzon, and the Earl of Derby. There were good longhorns still lingering within hail of Skiddaw and Crossfell, and the present Mr. Chapman did not return empty-handed from Mr. Fletcher of Rigg Wythop's sale in 1864. In the same year he also went to Hagley Hall, when the herd of the late Hon. Robert Curzon was sold off, and brought back bull calves from Magpie and Jackdaw, the first lots in the catalogue.

Of Mr. Chapman's three hundred acres, nearly one half is old grass, and the rest is generally farmed on the six-course system. He breaks up for oats, and sometimes dispenses with second seeds. There is a good marl subsoil, a little too strong for turnips and barley, and not admitting generally of eating off the turnips on the land. In 1856 Mr. Chapman won the £30 prize given by Mr. Packe, M.P., for the best-managed Leicestershire farm above 200 acres. The prize was only given for five years, and Mr. John Burbery of Ibstock, Mr. Breedon Everard of Groby Lodge, Mr. J. Toone of High Cross, and Mr. Simpkin of Hoby were the other winners. It has been laid down by professors, that the perpetual dairying of pasture land exhausts the phosphates. Mr. Chapman's father was of a very different opinion, and considered that the pastures which he had known for more than sixty years were doubled in value at the end of that period; but that "the burdens on the land more than kept pace with its improvement." The dairy herds in the neighbourhood are principally composed of Shorthorns and "Half-horns," the latter of which are, for the most part, a combination of Shorthorn on Longhorn. They come to good beef weights if not taken beyond a first cross; but of late years very little Longhorn element has been introduced among them. These herds generally number from 25 to 35, and a cow is expected to make from 3 to 4 cwt. (the long hundred of 120 lbs.) of cheese during the season, which may generally be taken to begin in April and last for seven months. Cheese has been as low as 50s., but 95s. per cwt. for a whole dairy was made by two or three dairymen this year.

Mr. Chapman considers that for cheese purposes the Longhorns are superior to the Shorthorns. His experiments with a Shorthorn friend, who selected his six best against the six Upton cracks in the height of the grass in June, showed that while the majority of pounds of milk was 152 lbs. to 135 lbs. in favour of the Shorthorn, the cheese curd from the larger quantity was only 14½ lbs. as against 19½ lbs. The trial was made again on September 20th with 36 Shorthorns against 32 Longhorns, and the 605 lbs. of milk (10 lbs. to a gallon) from the former made only 66½ lbs. of curd, when the 553 lbs. from the latter made 69 lbs. Of the Shorthorns 23 were well bred and 13 were guiltless of the Herd Book.

There are no "Half-horns" to be seen on Mr. Chapman's walls. Weaver's hand, which worked so deftly upon the Brother Collings in its day, has left its traces in a very finished painting of some Buckley sheep and pigs, the property of his late uncle, Mr. Thomas Chapman, of Stoneleigh; and we are reminded by a small likeness of his kinsman (by marriage), the late Mr. Henry Chamberlain, of Desford, of a very honoured name in Smithfield Club annals, not only as a double gold-medal winner with the best pen of Leicesters, but as a great exhibitor of Hereford stock, and steward and judge as well. The Marquis of Exeter is there; and so is that trusty stock-getter, old Sparkenhoe. Fifteen months ago he was beaten by Mr. Charles Bosworth's Shorthorn bull when they met at Loughboro', but Mr. Chapman had full revenge on the Prestwold blood that day, as he beat Mr. Packe, M.P.'s massive "White Velvet" ox, which took the first prize in the aged class at Islington this month. Two firsts each must also be credited to two rare oxen which stand together on canvas, with Stoke Golding church spire in the distance.

The Sparkenhoe Club was at first confined to Sparkenhoe Hundred, and began with monthly meetings at Kirkby and Bosworth in 1846, under the presidency of Mr. Henry Chamberlain. These meetings soon became quarterly, and merged in 1853 into an annual ploughing match. The ladies were then invited to join and dine, and initiate a poultry show, and so it has risen into its present eminence, loving everything save long speeches.

Mr. Chapman is pretty regular in his attendance at the two great Christmas shows, and he occasionally has a turn at the Leicestershire and the Warwickshire for the glory of the old breed. Nine firsts at London and six or seven at Birmingham have fallen to his lot, as well as firsts at the Exeter, Windsor, Battersea, and Plymouth Royals, but Long-horn men are shy showers, and some of these victories were walks-over. Old Sparkenhoe has departed to the Coventry butcher for £44 10s. at five off, and his skin alone fetched £2 8s. 4d. Had it been a bullock's it would have fetched even more. The thick skin is the very glory of the race; it weighs well to the currier, and it saves the beast much torture from the gadflies. When Arthur Young walked the earth, and found Bakewell among his cow teams, with his Long-horn bullocks "as fat as bears," and the boast on his lips that they had three-fifths of roast to two-fifths of boil, he estimated their hide as worth 15s. more to the tanner than the Shorthorn of that day. The bull, whose skin has caused this digression, was bred by Colonel Inge, and was by General Codrington, the Rollright sale bull of 1856, from a Rollright cow; and for 3½ seasons he was used to the Rollright, Cumberland, Weston Hill, Wroxhall, Curzon, and Upton tribes, of which the Upton herd is composed. The men of the West gathered with no slight wonderment round "The Marquis," in the Exeter show-yard; and when they espied Old Sparkenhoe at Plymouth, some, who were not aware of the similarity of the sort, would have it, "*This is the one you brought to Exeter fifteen years ago.*"

The leading points are of course identical with that of all other four-legged beef producers; but as regards colour, a white back, with spotted thigh and shoulder, and cherry red, spotty, brindled, or claret sides, are most liked. The coat should be as curly as possible, and a face with a darker shade intermixed is preferred to a white or "bald." A light-coloured or black nose is not liked, and its shade if possible should be in keeping with the sides. Mr. Gibbs of Blackford Mill had several whole-coloured red-brindles, and there have been some whites; but too much white is always thought to betoken delicacy, and the darker colours are preferred.

The horns begin to show the age-wrinkle after three, and run into all shapes. A good horn in a stirk should point a little upwards at first, and then curve downwards. The flesh-coloured horn, with blood veins about the root, shows high keep and breeding, and a cock-horn is consistently held in abhorrence. The wheel-horn is very common, but the points curl so much back into the cheeks that they have often to be sawn off. Sometimes each horn goes its own way—one curled back into the head, and the other reaching forward like a boxer's hands in position. There is also the "douk horn," which is more like an exaggerated hockey stick; and another variety goes into space straight away from the coronet.

The plainest cows are often the best milkers, and the milk of a seven or eight-year-old one is thought the richest. Some of the best "fillpails" have given their nineteen quarts at two meals, and the dairy farmers have in rare instances been able to calculate 4½ cwt. of cheese from one cow. They are kept in winter on barley-straw and pulped turnips, with hay in addition near calving time, and nurse well when called on during the first month or six weeks.

Unless it be some bull-elect, Mr. Chapman's calves never suck the cow. They have new milk from the first, which is lessened when the cheese-season begins, and gradually they come to oilcake and linseed boiled in whey, or the overnight's milk. As a rule they are dropped from the middle of March to the end of April, just in time for the cheese-season. They are remarkably good-tempered, and easy to do with, and the only fault which the butchers have against the bullocks is that there is not enough of the steel-yard inside them. Very few are exported; but Mr. Chapman has exported a couple of bulls to Montserrat in the West Indies, to cross with the native black cattle, and also sent several to Ireland. The Upton Herd at present numbers between seventy and eighty, and sometimes three dozen cows and heifers are in milk. The heifers are put to in their third summer, and their constitution, which is as tough as their skins, enable them often to work on till they are fourteen or fifteen years old. Of course, they are being perpetually replaced by younger ones, long before they are worked out, and go off to different herds for a change of blood; and during the last few years several Uptonian matrons have found their way to Spondon and Calke Abbey.

On entering the first shed we found old Lady Cheesepan under condemnation for losing a teat, which six calves had sucked during her nine years' pilgrimage; and there, too, was a good specimen of a bullock of Sparkenhoe's get, in equally steady and successful preparation for those Christmas boxes which the Smithfield Club dispenses with no niggard hand. These "prize-fighters" generally require a year-and-a-half of it with oilcake and a little meal as their flesh stimulants. Then we pass through the calf meadow, which contained seventeen Lord Curzons, over the sward which no plough-share has violated within legal memory; and threading divers hedges, where twenty generations of Longhorns have shaded themselves under the wide-spreading "crab apples," we reach the Big Meadow. About two miles away is the well, which alone is left to mark the spot on Bosworth field where King Richard lost his life and his crown. The Wars of the Roses still linger in one sense round the spot, but Mr. Michael Taverner's garden is the head-quarters of the many-coloured army, and the Sparkenhoe tent is their field of battle.

Two steers by old Sparkenhoe, and one of them half-brother to the £53 10s. steer at Mr. Cox's sale, stood at the gate, guarding this Longhorned harem. The lengthy Earl of Derby was in the very centre of the field, with a steer at his side, and his thirty-two spouses were grouped about him. There are some sights in wandering from herd to herd and flock to flock that you never forget again. John Quartly's Devon cows, as they filed down the meadow after the sale, one of them, "the cow called Brown," in-calf with Sobeski, a future Royal winner, and the Cranes' Shropshire ewes swelling into still grander proportions as we looked at them in the gloamin', were pleasant and incisive visions, and there is something very quaint and grand in a field full of Longhorns. Old Rose's fine bold eye had not been subdued by the weight of thirteen summers and the labour and sorrow of eleven calves. Well may Mr. Chapman say "*That old lady owes me nothing.*" Countess, her daughter, by Warner's Sir Richard, has rather more size; and from her we pass on to Spot, with her horn curled right into her face and her nine and ten quarts at a meal. The grey-faced Broadhorns is the dam of the feeding steer; and Lady Sparkenhoe a deep, nice cow. The big "Cumberland cow," with the hindlegs so neatly set on; and Duchess, the dam of Ivanhoe, and first at Sparkenhoe, are all high in the ranks. There, too, are Woodbine, by Warner's bull, lying, as usual, right away from the rest; Wroxhall, a sister of Earl of Derby's, and of rather a lighter brindle; old Crump, dam of the best of the two young steers; the light-coloured Strawberry, fellow-heifer with Ivanhoe in the show-yard; the dark old brindle Pailfiller, with her failing udder; and Bald-face, the marrow to Brindled Beauty, which went to Sir John Crewe's. They are generally out in the winter for four or five hours a-day. In the house they live principally on straw and turnips, which are cut, and then mixed by a combined machine, whose lift can be so managed as either to fill the store or load the carts outside, through an aperture in the barn wall.

A fine morning found us on our way to Calke Abbey. We were quickly through the "Manor of Temple" from which Lord Palmerston took his family name, but which is merely a small parish belonging to Earl Howe. His lordship's capital labourers' cottages catch our eye as we pass through Sibson (or Sibbesdon, as our forefathers were wont to spell it), as well as Twycross; and the latter village, with that motto—to which not a Leicestershire man will say Nay—of "*Let Curzon hold what Curzon held*", on its inn sign, is soon on our lee. Leaving Gopsall, with its belt of fox covers, on the right, we come to Snarestone, with its little flat-roofed, ivy-covered church and its pastures, which Mr. Spencer's well-known flock of Leicesters have cropped for many a long year. Then come the high-banked "conduit lanes," which were used for that purpose in one Wilkes's day. Our companion points out the direction of the Ravenstone flock (which Royal and Yorkshire Shows know well), and tells us of Mr. Brown's red shorthorn cow, which went up from these parts to win a Smithfield gold medal a quarter of a century ago. Duly meditating over these shorthorn and longwool honours, we wind past the old and newly-planted avenues of Lady Edith Abney Hastings, into Ashby-de-la-Zouch. There stands the Royal Hotel, with its great portico, and the Saline Cupola Baths behind; but there is no King Bladud or Beau Nash to bring them into fashion. On we go to Smisby (where the late Sir George Crewe kept a very fine herd of longhorns some thirty years ago), and leaving Castle Donington five or six miles to the right, we soon look down into the deep wooded hollow in which Calke Abbey is enbosomed. There are 500 acres of park, but from that point of view we should barely guess them at fifty. Passing through a line of trim-cut hedges, we reach Stanley's Barn, and find two bullocks and a freemartin in preparation for Christmas shows, at which the baronet's bullocks have already taken two firsts. No Holyrood-day sickle had been put to the fern in the park; and the deer—spotted black and reddish fallow—six hundred strong, were couching deep in it under the oak, ash, and chesnut shade, or coming down to drink at the mere. Donnington had furnished some bald-faced stags; and some mountain wilds an eagle, which is as good as a watch-dog in the farmyard, and barks persistently at every stranger, with bronchial tubes of steel.

Shorthorns had once almost a monopoly of those long cool sheds, both in Sir Henry and Sir George's day; and the very year before Sir John turned to Longhorns he sold the gold medal Smithfield cow, of his own breeding, to Mr. Faulkener, who brought her out. The cows were away in the pasture, and only the fine deep old Trimmer, bred by Colonel Inge, and two of Mr. Greaves's breed were left in the stalls. There were also some good Halfhorns, but the best of them was framing rather for beef than for milk. The first cross generally inclines in shape, horn, and colour to the sire; and in the second cross, the bull, whichever it be, has matters pretty well his own way.

From them we pass on to the herd, through the quiet solitudes of Piskern Wood. To the left is Melbourne, whose old church—which is supposed to have been built by Ethelred, A.D. 677—has just been restored by Mr. Gilbert Scott's hand, and across the stream is Spring Wood, the farthest boundary of the Quorn. For the first time out of Dorset we meet with a flock of Portlands, the love of which is hereditary at Calke. Sir John has nearly two hundred ewes of this breed, and goes down yearly to Portland to select or exchange rams. Some of them have been occasionally put to a Leicester ram, but only for the sake of breeding bigger fat lambs for sale or killing at home. A few have also been crossed with a Norfolk horned ram, and *vice versâ*, and a larger sheep than the Portland, with the same excellent quality of mutton, has been obtained; but the ewes of this cross have never been bred from. For the first time in our remembrance, a pen of Portlands (from Calke) made their appearance this Christmas at the Smithfield Club: and those visitors who totally despise catalogues, and tried to evolve the breed from their "inner consciousness," scratched their heads over them in vain, and passed on to the more familiar Lonks. The Abbey was under repair, and hence we could not see to any advantage the stuffed-bird cases with which the Watertonian tendencies of owners past and present have enriched it. Even the memorable Longhorn head of "Christmas 'Sixty-four" was not in his accustomed nook; and the driving rain played havoc with all enjoyment outside.

Sir John's Longhorn herd is principally formed by purchases from Col. Inge, Mr. Godfrey of Wigston Parva, Mr. Greaves, and Mr. Chapman. Mr. Burbery's Sampson, who won the first Royal prize at Warwick, did good service for his 50 gs.; and so did a bull from Mr. Cox, M.P. Six cows and heifers came from Upton, all in calf to Lord Curzon. Upton and Blackleg, the heifers, were both by old Sparkenhoe, and the former was the first prize one at Plymouth. Of the cows, Blossom and Brindled Beauty are both by Rollright, Mogul either by him or Washington, and Battersea another prize winner is of the "Old Cumberland sort." Lady is part of Mr. Godfrey's contingent, and small waste has been made by time upon her since she was the second prize cow at Warwick. Damson is another representative of Col. Inge; and Cherry Hagley and Tulip of Mr. Greaves of Carborough, near Lichfield. Blackleg still bears the marks on neck and shoulder of what almost killed her and gave her a name; and one almost black from Mr. Godfrey, another nearly whole red from the Hon. R. Curzon, and Upton were at an outstanding farm. But our paper notes were reduced to pulp, and we were right glad to put in to port at the steward Mr. Palmer's farm, and beguile the time with a peep at the three-year-old Sir Colin colt, which had won at Sparkenhoe the year before, and had just returned from Derby with another first rosette.

H. H. D.

ANIMAL AND VEGETABLE CHEMISTRY.

At the Newbury Farmers' Club, Mr. Hickman read a paper, in which he said,—There appears to be at the present day a far better appreciatiton of Chemistry than has heretofore existed; and this fact must be regarded as a matter for congratulation, because the acquisition or want of this really useful science affects the welfare of a constantly multiplying population. Chemistry has responded very readily to the appeals for assistance to supply the growing wants of the people. In consequence of these demands, and of a consequently larger development of the science during the present century, chemistry has been divided into several distinct branches: such as Agricultural, Pharmaceutical, Photographic, and Chemistry of the Arts and Manufactures. We should have great reason to be alarmed at the production of so much poisonous vapour by the constant respiration of the animal kingdom, were it not wisely ordered by Providence that by a grand compensation principle, the very substance emitted by us is eagerly taken up by the vegetable world, and re-converted into pure oxygen by the abstraction of the carbon, which goes to form the solid stems and leaves of plants. It is interesting to contemplate this beautiful harmonious arrangement, by which dead matter, vegetable life, and animal life, are bound inseparable together. We employ them in innumerable ways that minister to our wants or our comforts, and in so doing we ourselves supply, though unconsciously, the wants of those vegetable races that appear to grow only for our use and pleasure. The only remarkable feature about nitrogen is the curious anomaly its properties present. Surrounding plants and animals on all sides, and being of essential importance in their structures, it is not capable of being assimilated in the gaseous state. If it were, it would not be necessary to supply plants with it in the shape of ammonia, nitrate of soda, &c. An analysis of plants tells us that they possess the property of preparing, from simple inorganic elements which form a great portion of their food, the organic substances required as food by man and other animals, such as starch, sugar, gum, dextrin, which furnish food for the combustion which is always going on in the body, and producing the carbon by respiration, and nitrogenous and phosphatic substances, such as gluten and phosphates, soda, lime, and magnesia, that form blood, bone, and muscle—substances which are absorbed by exercise—and these compounds are returned by animals in a simpler state, to serve plants again for food. It is a matter of great importance that every farmer should know what each particular kind of crop requires, and also what he must add in the shape of manure, in case there be a deficiency of any substance in his soil. He requires to know as much, chemically, about his land as he does mechanically. For instance, the grass tribes (Graminaceæ) require an immense amount of silica (flint or sand), and phosphate of lime and alkalies. Beans (Legumen tribe), peas, and clover require lime and nitrogen. Potatoes do not require silica; nor do turnips; therefore these do not much interfere with the growth of wheat, barley, &c. Silica is generally abundant on all soils; sometimes to the extent of 80 per cent.; but because it is abundant, it must not be inferred that it is in the condition required by plants. Either some alkali must be present, or a very strong acid, such as "hydrofluoric," which is generated naturally in the soil. Chemists may hammer indefinitely, but no amount of mechanical force will render silica soluble, nor any other of the strongest acids except the one named; yet, what neither of these will do, chemical affinity with her gentle influence readily accomplishes. Plants require all their food to be supplied in a liquid state, hence the necessity for supplying silica in a state that will dissolve. From experiments made at Rothamsted, the largest amount of produce from both grass and corn crops has been when silicates of potash, lime, and soda have been liberally added with other manures. This is not surprising, because we have both a practical and theoretical explanation of the fact. Mr. Warrington informed us that a crop of wheat (average 30 bushels) contained in the ashes 98lbs. of silica; and out of 100lbs. of oat grain when burnt, there are about 26lbs. of ashes, in which there are 19lbs. of silica; in 100lbs. oat-straw there are 57lbs. of ashes, containing 45lbs. of silica. Of all manures no doubt farmyard is the best, taken on the whole, and the reason is plain when we look at the analysis, and find that it contains a little of everything that plants require for growth: of course, well made manure, and not that from which the more valuable portions in the liquid state have been allowed to drain off into the horse-pond. We notice how valuable the salts of ammonia have proved in these experiments, and yet, strange as it may appear, an immense quantity is annually wasted at the gas-works. I think its utilization would prove of mutual advantage to both farmers and townsmen. A few days ago, I procured a gallon of the ammoniacal liquor from the gas-works, in order to ascertain how much ammonia was thrown away annually. Having saturated it with commercial sulphuric acid, I proceeded to evaporate it to procure the commercial sulphate of ammonia. It certainly was the most horrid chemical experiment I have ever made, for the amount of that abominable smelling gas, sulphuretted hydrogen, driven off by the process, which took about four hours, was something dreadful. However, I succeeded in extracting 12 ounces of sulphate ammonia from the gallon, and it appears that 25 gallons are daily wasted of this rich substance. Calculating 25 gallons daily, 12 ounces per gallon, it follows that no less than 3 tons 1 cwt. 11lbs. are annually wasted. Market price is £17 per ton. Two tons sulphuric acid to saturate cost £12; deducting £12 from £52, leaves £40 wasted through want of co-operation. Artificial manures occupy a very great interest at the present time, and being found of essential importance in the growth of crops, the quantity used increases annually. It is exceedingly to be regretted that many farmers have been sadly imposed upon, either by the unprincipled or ignorant dealer. In some cases of failure, it is possibly not the fault of the manure so much perhaps as the peculiarity of the season and the nature of the soil. But no doubt can exist of the impudent frauds which are carried on in this line by men who seem to rely more upon their want of shame than upon the value of their articles for getting a living. Only last Tuesday I was talking with an analytical chemist of considerable note, and he said, "Look, here is a specimen I have analyzed of guano, charged about £12 per ton: the commercial value is properly £2 per ton." Facts of this kind speak for themselves, and show the necessity of either buying of men of undoubted integrity, or insisting upon a guarantee of the composition of the manure purchased. However extravagant the names, the composition, is the point, and no power, magic, or anything else can make plants derive benefit from elements which are unsuited for them. Taking these facts for granted, it follows that the excretions of man are the richest form of all animal manure, and in approaching this at-first-sight-somewhat-indelicate subject, I would venture to say that it should be viewed in a philosophical spirit, and not in a fastidious or mock-modest manner. It is then far from being repulsive—only another proof of that economy manifested in Creation. Man has congregated into closely-crowded cities for various facilities, and more especially for the advantages of diffusing more readily knowledge of wealth —but at the corresponding loss of pure air, and the sacrifice of health. Of course food has followed man wherever he has congregated, and the vast amount consumed annually in our large and rapidly-increasing towns and cities in the shape of cattle, corn, vegetables, &c., which have all abstracted some elements from the earth that are essential for the growth of plants, and that ought by the laws of nature to be returned richer than when removed, has caused a drain upon the resources of England's fertility. Sewage, however, is not disposed of usefully, now that the system of water-drainage has been adopted. The visitations of the cholera during late years has brought about the water system of drainage, and the removal of the sewage in any shape, so long as it was disposed of, seems to have been a happy relief. So it has happened that, although sewage is disposed of, and perhaps the immediate local health improved, that the difficulty has not been removed. Our rivers are intolerably polluted—fish are actually poisoned—pleasure-seekers, fishing or boating, find their enjoyment marred by disgusting effluvia—and last, but not of least importance, the health of the inhabitants of those towns that depend for a water supply upon that river into which the refuse matters of the towns above has been poured is seriously endangered; whilst, after all, the farmers themselves are obliged to resort to artificial assistance to replace those elements whose mis-application has proved such a bane. Surely this is a sign that the machinery of nature is out of gear. Baron Liebig has always upheld the utilisation of sewage, and has been one of its strongest supporters. Two years ago, in a letter to the Lord Mayor of London, he said, "When guano fails, or when political or other events stop the importation of manure into England, it may well be doubted whether opinions like the foregoing (alluding to opposition he had met with), unsupported by facts, and in direct opposition to the laws of science, will avail to ward-off existing evils." It is well known that experiments have been tried, and are being tried, to render this state of things more pleasant. The advantages to be sought for from the utilization of sewage should be, an easy mode of disposing of it, and a purification of our rivers, without a corresponding detriment to the health of towns. In order to learn something practically about this subject, I went to Croydon last week, in order to get some information. There I met with most courteous reception, and every opportunity was cheerfully given for a thorough inspection. I gleaned a few facts during my visit: That sewage can be most profitably applied to meadow and ryegrass. One acre will take the sewage of 100 persons; and the total amount per head per annum is estimated at 50 tons in a state of dilution. The sewage flows in drains; and, by intercepting the drains, the sewage is distributed on to the land: it passes over the land once or twice, and sometimes three times, and joins the river Wandle quite clear and pure. The Italian ryegrass, after three years, dies away, and the earth wants ploughing up, and then an intermediate crop of mangolds may be taken. The first year's growth cut five times, the second four times, and the third three times. At Croydon, 57 tons of grass per acre were cut during the last twelve months. Previous to using the sewage for irrigation, several schemes for deodorizing it were tried, and all turned out to be expensive failures. Now, the Board of Health made £300 per annum for the sewage. The chief object to obtain a larger increase of products, and, at the same time, purify the river, is accomplished as the results show:—

Analysis of Water from—	Drainage.	Sewage.	River Wandle,
Inorganic matter	23.40	48.30	20.16
Organic matter	2.40	52.20	2.08

At Edinburgh, larger amounts of sewage are applied than anywhere else, and it is for that reason that larger amounts of produce are obtained than anywhere else; but the absorbent powers of Mother Earth must not be too severely taxed, or she will not fulfil her duties faithfully, and sewage would not be purified. Generally from four to five crops of grass are obtained per acre annually, amounting to 30, 40, 50, 60, or even more tons per acre, averaging perhaps £25. These facts speak for themselves. "Another advantage of the application of sewage to grass lands would be an enormous increase in the quantity and quality of milk, butter, cheese, and meat; whilst, by the consumption of the grass, a large amount of solid manure, applicable to arable land and to crops generally, would be produced." The Newbury Town Council being about to consider this question of utilization, I have mentioned these facts, knowing that John Bull generally wishes to ascertain if it will pay before commencing anything rather uncertain. I am aware that there are present many who, living some distance from town, the question does not directly concern; but, indirectly, it concerns everyone. The wealth and the health of the nation alike are affected by it; and, being one of those points that link town and country life together, I have addressed you on it, deeming it an appropriate subject for a townsman. In conclusion, I wish to add that it has been my endeavour to make this paper as intelligible as possible, avoiding abstruse terms and tecnical phrases. I have been more irrelevant than I ought to have been, but this kind of thing is rather a novelty for me; but if my paper has been the means of imparting any information, my end will have been answered.

Mr. Hunt said that, being a near resident of the town, he could endorse the opinion expressed by Mr. Hickman, for he had found great benefit arise from the use of night-soil as manure. He generally used it to turnip crops; and he thought it was more suitable to turnips than anything else, because there was not in that neighbourhood a large breadth of land sown with grass. He considered it one of the best manures they could use. The difficulty was in getting a sufficient quantity in the state they required it (in a crude state), and the farmer could fix the ammonia himself. He had tried it for many years, and he contended that it was cheaper and better than anything else; and, if they could get it in its crude state, he considered it was one of the best adjuncts to the farmyard.

Mr. Hickman thought that Mr. Hunter had misunderstood him: it was only liquid manure that was used at Croydon, the solid was sold.

Mr. Everett said that he had no doubt that carefully conducted experiments by practical men would be very beneficial. The labour of agricultural chemists was very considerable, and the work carried out in the laboratory was of the most laborious kind. He was personally acquainted with one of the first chemists in Europe—Dr. Voelcker—and the labour he went through was something enormous. He thought, therefore, that the least practical men could do—especially farmers—was to make some return for what agricultural chemists had done for them, and themselves carefully conduct field experiments. Mr. Warrington, who gave them an able lecture some time ago, had left several papers containing experiments—and if each member would make one experiment, and publish the result, the reputation of the Club would be thoroughly established. If he were correct, he understood from Mr. Hickman that the result of Lawes' experiments with wheat and grass was that the combination of ammoniacal and superphosphate was the best. Liebig was very prone to contradict a great deal stated by Lawes; but possibly the difference of opinion between the two chemists arose in a great measure from the different kinds of soils on which the experiments were made. The former practised on a cold, unkind ill-working clay, and Liebig on a light sandy soil. It was of the greatest importance, when experiments were conducted, that the kind of soil on which the experiments were made should be given. He believed that this was never mentioned. With regard to artificial manure, especially oilcake, he wished to draw attention to the vast amount of adulteration that had been going on for years, and yet farmers take no interest in the matter. In many instances they were in danger of giving £5, £6, or £7 for superphosphate which was not worth £1.

Mr. S. Wentworth thought the experiments of Messrs. Lawes and Gilbert were made more of than they ought to be. Mr. Hickman had mentioned that the runnings from the farmyard was a good manure. He had drilled in the black water from his horse pond, and he thought that the good qualities must have evaporated, for the ground was not much benefited.

Mr. Hickman: Perhaps it was largely diluted.

Mr. Wentworth: Not particularly. With regard to experiments, I think they should be carried out to a nicety, and that is rather too expensive a process at the present time.

Mr. H. Frampton said he was sure they must all feel deeply indebted to Mr. Hickman for his valuable paper. If the Club could adopt Mr. Everett's suggestion with regard to experiments, he would be happy to do so, even at a loss, if some other members of the Club would take one each. He thought Mr. Wentworth must make a mistake with regard to black water, and that the water he used was much diluted. He thought that every farmer must feel that a knowledge of practical chemistry was of the greatest importance.

The Chairman proposed a vote of thanks to Mr. Hickman, for his very able paper, and said that he gathered from the discussion that, after all, ammonia was the grand secret, and if they could only collect it they would be doing themselves a great benefit, as well as improving the produce of the soil. Their weakest point was their farm-buildings, and owners should improve them. Artificial manures were a great means, but only a means, of improvement to the soil. They had heard that it was in contemplation to collect and economise the sewage of Newbury, and he saw before him the mayor, who took an active part in everything that concerned the welfare of the town, and therefore he took upon himself to suggest the consideration of earth-closets, which appeared in the daily papers from time to time. He had no doubt, that if by this process they could collect the solid manure, they would receive the thanks of the agricultural community, and do a great deal of good. He hoped they would adopt Mr. Everett's suggestion with respects to agricultural experiments. He (the Chairman) was in possession of Mr. Warrington's papers, and any gentleman could carry out the experiments with very liitle difficulty. The next paper would be read by Mr. Wentworth, on "Winter Management of Stock" (Hear, hear). He hoped the 70 members of the Club would take more interest in the cussions, and volunteer their services.

THE WAY TO CATCH SWINE.—Swine of all ages and conditions, are, commonly, averse to being handled; and they manifest their disapprobation of it by squealing, kicking, and fighting; and, when a number are together, of certain breeds, the pugnacity of the whole herd is aroused when we attempt to handle one of their number. Pigs and hogs that one man can handle, should be caught by one hind leg with one hand, while the other hand and arm is passed around the body, and they are taken up in the arms, with their back against the catcher. Large hogs should be caught, first by the hind legs, when two other hands seize him by the ears and bristles. Now he opens his mouth, and like a stentor cries, "*murderation!*" Now have a noose on the end of a rope ready, and slip it around his snout. (Sows with pig should seldom be noosed). In order to get the rope on the hind leg, when they are feeding at the trough go up carefully behind them and lay the noose on the floor, close to the foot, holding it with one hand, and touch the leg with a little stick, and the hog will take up his foot, when the noose must be instantly moved, so that he will step in it. Now raise it above the hoof, nearly to the hock joint, and draw it tight, and he is fast. After we have succeeded in raising his leg, he is easily managed. If he is a large, strong animal, crowd him into a corner with a handspike, after his leg is noosed, then it will be easy to noose his snout.—*Cor. Boston Cultivator.*

JUDICIOUS CROSSING.—SHROPSHIRE SHEEP.

At the monthly meeting of the Winfrith Farmers' Club

Mr. Marks said: This subject certainly opens a wide field for discussion, and I therefore hope all present will freely and candidly give their experience and opinions on the question, so that it may be well ventilated by a lengthy discussion, which is far better than a long introduction. It is a well-known fact that the agriculturists of this country find their expenditures and outgoings gradually increase, in the shape of rates, labour, artificials, &c., to say nothing about rent, without their taxes diminishing in strict accordance with free trade. We must therefore endeavour to farm in such a way as to meet these increasing expenditures. Now I look on stock, *i. e.*, live stock, as the key of farming. If I am right, it must, or ought to be, our first consideration to keep that which is most profitable. I will first speak of cattle. Any person I consider is a general benefactor who can in any legitimate way increase a national commodity of consumption. Now I think this may be attended by a judicious cross; for, whatever our favourite breed may be, one cross may be acted on without losing much of the general character of that breed. For four or five years I used Shorthorn bulls, my herd being principally Devons, getting as well as I could one cross through. With such cross I use Devon bulls, intending to continue such until I find the greater portion of the benefit I have gained is lost, such benefit being more size and milk, and retaining to the fullest degree that constitution the Devons are known to possess. My opinion, therefore, is that good effects may result from crossing herds of Devons or Herefords with well-selected Shorthorn animals that have been bred from good milch cows, this being an important item to our dairies, which are principally kept for their produce in butter. Now, after this or any other cross is made, there is one thing that demands our best attention and care, *i. e.*, the rearing, it being of no use to go to great expense in producing (however judicious the cross) except the rearing is well done. My own experience tells me it is economical to give young cattle corn or cake till they are fifteen or sixteen months old (supposing they are calved in January or February), with a moderate supply of roots when there is no grass; after which, in tolerably good pastures, they will do without cake till October, when they are best in a shed by night, having hay and 3lbs. of rapecake per day, or, if in calf, 5lbs. The best may thus be brought into the dairy the second summer. I may here remark that I always give my dairy cows when in the straw-yard from 3lb. to 5lb. of rapecake, according to quality of straw. There are many other crosses, which I need not particularize, that have been the means of doing much good; besides, time has not permitted me to do so. I will, therefore, say a few words about sheep. You no doubt remember being told by a member of this club—one who is properly held up as the best sheep farmer in the county—that sheep did not pay. Now, if this can be said by such a person, we all ought to endeavour, living as we do in a sheep farming district, to do our utmost; for, if stock is the key, sheep is undoubtedly the principal working part, and "pay" or "no pay," we can do but little without them, as on this our crops of corn mainly depend. Now, as sheep must be kept, the question comes, What sort will lose the least? Such a question must be answered individually, according to situation and pasturage; but, on high exposed situations, with poor Down lands as pasturage, I think a cross with the Shropshire may prove very beneficial, they being a particularly hardy breed, with great aptitude to fatten. I have used Shropshires with my flock (which you know is what is called the West Country Down) with a result, up to the present time, that has much pleased me. I have now three ages of such cross, and am satisfied I have more wool and stronger constitution, with more flesh-making properties in them. Where I used to lose six in a disease of the lungs, which caused such to adhere to the side, I now lose one or scarcely that. Some may say you cannot use these Shropshire sheep with our Down flocks without getting a speck in the face. Such I have really found is the case; but it is the exception rather than the rule. Having the same ages of other ewes, I can say that my crossed four-tooth ewes are looking better than the other six-tooth, with a better prospect of being quite as large at the same age, while they have all been kept together. Therefore I think this cross is worth consideration to those living in cold, exposed situations. We know that Shropshire is a cold county, and those sheep would be of no use in that district unless they were particularly hardy. As regards other stock, there is of course the horse and pig; but I have had no time, and scarcely deem it worth while, to enter into that part of the subject. I never was very much of a pig farmer; but I am fond of seeing good horses. Still we live in a district that is not very favourable to horse breeding, therefore I need not dilate upon that question. I must now leave the subject in your hands, and trust to hear the opinions of those present on the various points worthy of elucidation.

Mr. Reader said this was a subject very interesting to all of them. He could not say anything about crossing cattle, because he never had any experience in that way, his stock of that description being very small. But, with respect to sheep, he certainly thought judicious crossing would pay. About eleven years ago he obtained a Leicester ram, which cost him some money, and many people blamed him for using it; but he found it was of considerable advantage to himself, and he made considerably more money of his wool for two or three years afterwards. During the last few years he had infused a little of the Shropshire blood; and he was perfectly satisfied with it. He believed that, if they selected from some flocks, they would produce spotted faces and legs; but many of them were as free from spots as the Hampshire. His sheep were quite as good colour as before he used the Shropshires; and he believed they could bring the produce into as good condition in a year and three-quarters as they could the Hampshires in two years and three-quarters. There was considerably more proof in them, and they were quite as good in the heart as the Sussex, in which respect the Hampshires were deficient. On this point, he could not help thinking of as good a flock of sheep as there was in this county. Some few years ago a gentleman showed several very fine rams at Dorchester: one was noticed as being exceedingly good; and he found out that this was the very sheep that had been crossed with a Shropshire. Many people said it was the best sheep in the pen—there was a better quality about it. He believed it was got by one Mr. Saunders bought of Mr. Mansell, a well-known Shropshire breeder. He did not think they were quite as large in the frame as the Hampshire Downs; but he believed they could make them as heavy. Lady Willoughby de Broke had been paid by the butcher for 193lb. of mutton from one of these sheep, at the early age of a year and three-quarters. That would give them an idea of what they could be brought to. The Hampshires were better than they were a few years ago; but they were too coarse to suit his fancy. He never regretted crossing, because he believed a cross was good for the butcher and the breeder.

Mr. W. Budden said he could bear out what Mr. Reader had said about the Leicester cross. He recollected buying a dozen lambs from him, after his first cross; and he must say he never saw such a difference in the length of the wool afterwards from using those animals, while there was only one light-faced lamb out of four hundred. He did not go further, but they found a considerable difference in the quantity of wool for several years after that second cross. It was well known that they could not do anything here with very coarse sheep, and they could not keep any flesh on some such as he had seen from the neighbourhood of Ringwood. There were, however, the Improved Hampshires, which were much better, and Mr. Saunders's were very good, about as fine as the Sussex. He quite agreed with Mr. Marke that one particular sort of animal would not do for the dairy. They must cross. He found that a pure Devon heifer would not do. They kept in good condition, but would not pay the dairyman. There was no doubt that a cross with the short-horn was very beneficial, producing much more for the dairy. For working beasts, however, they could not have anything better than the pure Devons.

Mr. **Reader** said he ought to have told them that, owing to the remarks of many of his friends, he put the Leicester ram he bought only to one hundred ewes the first year. The lambs all ran together with the pure downs, but the cross-bred wethers went out on an average three months before the others, and brought 8s. some odd pence more, besides cutting more wool.

The **Chairman** (Mr. T. H. Saunders) remarked that with respect to crossing cattle there was, no doubt, much to be done by judicious selection. He started with Devons at first, but the dairyman said they could not give anything for them. He had crossed with the Short-horn and the Hereford, and found it much better. Now, he had gone very much into the Hereford breed, with satisfactory results. He had seen very great improvement from a short-born bull, particularly with Devon cows. He scarcely knew which to prefer, a Hereford or a short-horn, to go with a Devon cow; but for milking purposes he should select the short-horn. With respect to sheep, there had been a good deal said about the Shropshires. He had had a little experience in that way. He bought a Shropshire of the best class, and gave a great deal of money for it. He put twenty-eight of the best ewes on his farm to it, and although he kept it for four or five years he had never occasion to use it again, though he had no fault to find with the animal. He ear-marked every one of the lambs from those twenty-eight ewes, as he thought he should have a good opportunity during their life-time of seeing which were the best. They cut a fair quantity of wool; but he never got any good ewes from them, as they did not come to size, though as to the rams he had none that did better. He could not tell them how it was, for they were out of the best ewes he had; but other persons had told him they had observed the same. He bred four or five of the rams, and they were always sheep that kept in good condition. As to the sheep Mr. Reader had alluded to, he did not attribute its excellence to the ram, but rather to the breed of the ewe, for its grandam was always remarkably good in the rump. He had always noticed that sheep from that family did remarkably well, and as he kept a pedigree book he could easily trace back sheep to their parentage. He liked to have a good constitution that would carry an animal well through life. They might have a lamb which was very promising, but it might not be so good the next year; and he had had better sheep in the third generation than from the Shropshire sheep, when he had got his own ewe blood in them. He had let the Shropshire generally; but he used one of its get, though the produce was not quite up to the size. He bred from a ewe that he always thought had a stain of Cotswold. He had used a son of that sheep, and got two or three very good rams, from a ewe that always cut a very good lot of wool. He kept the sheep to see how the ewes turned out, and if they had given any improvement he would have gone further into it. He had only put the Shropshire to the twenty-eight ewes he had alluded to, but not afterwards. He had nothing to complain of respecting the colour, and he got plenty of wool; but he found it lessened the size of the ewes very much. As to the coarse Hampshires, they would never do; but the improved quality had many valuable properties. What they wanted in these days was a sheep that would soon get fat and come up well to the touch. He did not allow his rams to go ahead of the other sheep on his farm. The great thing is to look to breed; but it was very easy to put flesh on an animal so as to deceive almost any man. He never wished to let any animals that he would not use himself; and he must say that he never had better luck than from what he bred himself, or what they were pleased to call the Watercombe breed.

The proceedings closed with a vote of thanks to Mr Marks.

THE USES OF A CHAMBER OF AGRICULTURE.

At the Staffordshire meeting,

Lord **Lichfield** said that, having communicated with some of the principal landowners and tenant farmers in the county, he thought the time had come when they should make some movement with a view to establishing a county Chamber of Agriculture. The subject had been so much ventilated that it was unnecessary to go at any length into the reasons in favour of the establishment of such an association, the principal object in view being to create an organization by means of which the agricultural interest could bring its views to bear with greater weight upon Parliament and upon the Government of the country. He could scarcely better illustrate the want of such an association than by calling their attention to what had occurred recently in connection with the cattle plague. As they were well aware, various rules and regulations as to the movement of cattle from one district to another had, during the past twelve months, been from time to time adopted, rescinded, re-enacted, &c., &c. (laughter), so that owing to the frequent alteration, and, in many instances, the conflicting nature of those regulations, very great difficulty and inconvenience had been caused to farmers and others throughout the country from being unable to ascertain clearly what the regulations were (Hear, hear). But, although he had expressed himself strongly as to the unsatisfactory manner in which both the late and the present Government had dealt with this matter, he did not think the Governments were wholly to blame; he was rather inclined to believe that the real cause of the unsatisfactory legislation which had taken place on the subject was to be found in the fact that neither Government nor Parliament had the opportunity of properly ascertaining what the views of the farmers throughout the country were; and it stood to reason that it was so, because if a question of this kind was to be dealt with by Parliament, and if they received suggestions and advice from one county in one sense, and from another county in another sense, it was impossible to know which was right, and thus Government found itself in many cases obliged to adopt the alternative course of doing nothing, or at least they had the excuse of not knowing what the real opinion of the country was upon a subject for not doing anything. This had been the case, he had no doubt, more than once during the past twelve months (Hear, hear). His Lordship said they might take, as another illustration, the question of the Malt-tax. He had very often heard the House of Commons abused on this question, and he had often heard it remarked that the subject was frequently far better handled by a meeting of farmers, at one of their agricultural dinners, than in the House of Commons (Hear, hear). The reason for this was that even the farmers themselves were not agreed on the subject, and had never yet brought to bear any organized weight on the Government, with a view to its being dealt with by legislation. He did not see how the agricultural interest throughout the country could better bring their opinions to bear upon the Government than through such organizations as these suggested Chambers of Agriculture. The Central Chamber of Agriculture, which was already established in London, proposed to afford a representation of the views of the different districts and counties throughout England, Wales, and Scotland, by means of delegates from the different local Chambers to be established throughout those countries. He was not prepared to say at present how far the system proposed to be adopted by the Central Chamber would exactly succeed in obtaining the representation to be desired. There was, however, no necessity then for considering the expediency of connecting themselves with the Central Chamber, and therefore he would not attempt on that occasion to point out the advantages which might arise from such connection with the Central Chamber, as at present constituted, but point out what he thought—and on which he should ask their opinions—ought to be the system on which they should work. It appeared to him that the members of such a Central Chamber should represent whole districts, whether of counties or parts of counties. That was a most important point to consider at the very outset of the question, and one he thought had not been as yet sufficiently considered, because, when he asked himself whether the Central Chamber of Agriculture, as at present constituted, had the weight it was desirable such a body should have, he was very much inclined to ask, "Whom do you represent?" The answer to that was not perfectly clear, and without going into details it was sufficient to say that there was no organized system on which it professed to represent the different districts of the country. Mr. Pell, the president of the Central Chamber, had been kind enough to attend that meeting, and would hear any opinion which might be expressed as to the constitution of the Central Chamber, and would afford any information which might be required; but it did not appear necessary in the first instance to consider the question of connecting the chamber proposed to be established in this country with the Central Chamber; but he would suggest that they should act on the principle that it is desirable and important that the agricultural districts of this county should be in some way represented upon a Central Chamber. They must leave to others to provide that Chamber, being ready to afford them the means of representing the very important agricultural interests of that county, should a Central Chamber be so constituted as to give them confidence. With regard to the Chamber of Agriculture which was going to be proposed to be established for this county, it might be asked, Why did they want a Chamber of that description at all? His answer to such a question would be that at present there was no machinery of any kind in existence such as other interests in the country had, by which the agricultural interest could give expression to their opinions and requirements, and bring them to bear with real weight upon the Government of this country in the consideration of all questions affecting them. There was no other interest that was not directly or indirectly represented through their Chambers of Commerce and other bodies in all the different towns and manufacturing districts throughout the country, whilst they, the landowners and agriculturists, had nothing of the kind (Hear, hear). Certainly they had their agricultural societies; but, as they well knew, it wasa rule with them to exclude, at their meetings, what at the present day was most important to them, questions of a political character, and by so doing they excluded the consideration of many subjects bearing directly upon their interests. Now, he was sure they would all agree with him that it was most important that farmers should have some means of fairly and temperately discussing those political questions—he did not mean party politics—but those questions which threatened, or were likely in any way to affect their interests. He thought that on such matters the broadest distinction possible might always be drawn between the discussion of political subjects, affecting their own peculiar interests, and party political discussions. For himself, he could not see the slighest reason why any one of the different subjects affecting their interests, which were likely to become the subject of legislation, should not be discussed by Chambers of Agriculture. Let them take one of the most important questions affecting the interests of all connected with land, which was likely shortly to be entertained. A strong endeavour was being made on the part of some persons to get rid of the different turnpikes throughout the country. He did not think there was any question more likely to affect the agricultural interst, and one which it was more necessary to keep a strict watch upon, than this. If the roads were to be kept in repair by a rate on the adjoining properties, it must in any case throw a heavy burden both upon the owners and occupiers of that property to keep the turnpike roads in repair for the benefit of other people. He wished it to be understood that he offered no opinion on the subject, but simply pointed it out as one worthy their consideration, and desired to impress upon them the importance, as tenant farmers and owners of land, of keeping a close watch on such questions, and also how desirable it was for them to be in a position to bring their views practically before Government when such a question was brought forward for discussion. He was inclined to think that the system of excluding the discussion of politics from their agricultural meetings—more particularly latterly—had created too much shyness between tenant farmers and their landlords in discussing these questions. Let them take again the question of the game-laws, which excited differences of opinion between tenants and landowners. Why that question could not be discussed in a proper and rational spirit he could not conceive. He had often heard the expression of a very strong feeling with regard to the question, but he had never heard anyone go to the root of it, and show, for instance, what they would propose in their place, to prevent the infringement of the rights of property which the simple repeal of the game-laws would bring about. He had no doubt, however, that if the subject was discussed between owners and occupiers they would come to some rational conclusion. Then there was another important question with regard to the education of the working classes and the rural population, and his opinion was that the time had now arrived when there was a strong necessity for Parliament to legislate on this subject for the country generally, and to apply some uniform system—they might call it compulsory education if they liked, he did not—but some system by which they might secure the education of all classes, in all employments throughout the country. He had just referred to these questions because he considered them such as might, and he trusted would be advantageously discussed in local Chambers of Agriculture throughout the country. Amongst the subjects which might profitably engage the attention of such a Chamber was that of insurance against losses of cattle from disease, a subject as to which he acknowledged that he was utterly in the dark as to the real feeling of the farmers, for he could not make out whether they felt it important or not. An association for this object was established for the county, and when the cattle-plague was at the door there was a general rush into it, and it was enabled to afford a considerable amount of protection against loss; but the moment the cattle-plague declined, all interest in it ceased. He did not give any opinion: he only said he was utterly at a loss to understand what the feelings of the farmers really were on the subject, whether they thought it desirable to have such a county insurance association or not. As a society its principles were as sound, and its rules as good as those of any society could be; but the fact was that only eighteen members joined it in five or six months. He merely mentioned this to show the difficulty of ascertaining what were really the views of the farmers on this and other subjects. He must leave it to them to consider whether these and other important questions could be considered with advantage by such a chamber as he had suggested. (Applause.)

Lord HARROWBY, in proposing the first resolution, observed that the question was not without its difficulties, and Lord Lichfield had pointed out some, more especially in relation to the central board in London, and before a chamber representing the county of Stafford would connect itself with a central body it would be necessary to inquiry the conditions of representation—whether the delegate of a small club, paying some £5 a year would have the same weight as the representative of the county of Stafford. If such a chamber were limited to discussion it would not so much matter; but if its conclusions were to be determined by a majority, it was important to know if large bodies of farmers were to have only the same voice as smaller sections. But the question for them to determine was whether it was desirable for them to have for their own county such an association as his lordship had indicated, and he had to propose—"That it is desirable to establish a Chamber of Agriculture for the county of Stafford for the discussion of subjects bearing upon agriculture, and to watch over all measures affecting agricultural interests, whether in or out of Parliament." There could be no doubt, as Lord Lichfield had stated, that the exclusion of all topics which formed the subject of consideration in Parliament from our existing agricultural societies materially enfeebled the influence of the agricultural interest upon the public mind, and upon Parliament. That rule was no doubt sometimes infringed. The force of nature would have its way, and a man who had thought a good deal on an agricultural subject upon which Government was taking action, would speak about it, notwithstanding rules to the contrary. The result was a kind of awkward scramble. One man transgressed; another rebuked him, and in doing so committed the same violation of rule; so that discussion was not carried on with that freedom and openness which gave it the value it ought to possess. It was, therefore, very desirable that there should be some means by which the agricultural interest of the country might fairly speak its mind on subjects bearing upon it, even though they formed the subject of the action of the Parliament or the Government. There were many questions to which those remarks would apply. For instance, there was a growing tendency in the present day to throw the weight of taxation on that kind of property which was visible and tangible; and this system had its conveniences, because it was easier to deal with what could be seen and handled than with what might be in a man's pocket or in his portfolio. At the same time it was very unfair, and it was an increasing unfairness, because the increase in the value of personal property was much greater than in the value of real property, and it required the same amount of protection, and the same conveniences as real property, and it was therefore most desirable that those connected with that kind of property should have an opportunity of forming and expressing their opinion on such questions. The proposed local association offered, no doubt, very considerable facilities for such a purpose; the difficulty was to maintain the interest in the absence of exciting topics, as they had heard in the case of the Insurance Association the interest ceased when the pressing danger had passed away; and he feared similar experience would attend the proposed chambers. It was difficult to get people to sacrifice their time when there was no subject of pressing interest, and that applied especially to the agricultural interest. In a town a man had only to put on his hat and walk across the street; but when a man had to drive ten, twenty, or thirty miles to attend a meeting, it was a much more serious matter. It was, however, important to consider that the very fact that the agricultural interest was so scattered and dispersed should be a reason for adopting some means of bringing them together for the purposes of discussion and of common action. The course of political action in this country of late years had been to give increased influence to the town population as contrasted with the country. It was difficult to counteract that tendency, from the population of towns being more concentrated; but as the great object of Government should, he thought, be to protect minorities against majorities—for majorities could take care of themselves—if it were true that the population of the towns was more numerous than that of the country, it was of the greater importance that the latter should adopt some means by which they might secure that degree of concentration which the town populations possessed, without any artificial organization whatever. His lordship repeated his doubts as to representations of local chambers of agriculture in one central chamber, and, reserving his opinion on that point, moved the adoption of the resolution.

Mr. PELL, in response to Lord Lichfield, said he was free to confess that the difficulty pointed out by the noble Chairman and the Earl of Harrowby had arisen through a defect in the rules of the Central Chamber. They had, however, only been recently formed, and like the larger constitution under which we lived it must grow and, perhaps, be licked into shape. He was very glad he had had an opportunity of being present at that meeting to hear the suggestions that had been thrown out. He had no doubt that when the next general meeting of the Central Chamber was held the rules as they now stood would be altered so to meet the difficulty pointed out. With regard to the connection of local chambers with the central body, and the advantages to be derived therefrom, of course they did not expect that the same representatives would always come to their meetings, but rather that the different chambers would send up those gentlemen who were best able to deal with the different questions to be brought under the notice of the Central Chamber.

TURNPIKE TRUSTS.

The November meeting of the Cirencester Farmers' Club was held at the King's Head Assembly Rooms, on Monday, November 19th, Mr. Edward Bowly in the chair.

Sir M. E. HICKS-BEACH, Bart., M.P., said: I was very glad to accept the hint of one of the most influential members of your club (Mr. Edmonds, of Southrop) that I should undertake to open a discussion on this subject this evening; for I felt that, although not a member of your club, yet, looking at my position amongst you, and the importance of the subject, it was of the greatest moment that I should learn what your sentiments were upon it (Hear, hear). I come here this evening prepared, in some respects, with information which I have been able to collect upon this subject, and ready to do what I can to impart that knowledge to you (cheers). I hope also to hear whatever opinions or knowledge any of you may have formed or collected; and I shall be most willing to accept any hints or suggestions that may appear to me to be really good, and suited for the attainment of the end we have in view—the better management of the roads (Hear, hear). There are many among you who, having had many years' experience as surveyors and waywardens, are really better qualified than I to give a practical opinion on this question; and I again assure you that I shall receive your hints and suggestions with the greatest pleasure, and they will materially influence my future conduct (Hear, hear). I will divide this subject into two distinct heads. We will consider, first, the law with regard to turnpike-roads; and, second, what beneficial alterations might be proposed in its stead. You are all, of course, aware that many years since—I suppose more than a century ago—the roads of this country were little better than tracks. At about the time that coaches were first established, and traffic really began to be developed, larger roads were found necessary, and these were first formed between the principal towns. In many places, to make and maintain these roads, Government advanced large sums of money. The Holyhead road was an instance of that kind. In other cases, large sums of money were borrowed by mortgage of the tolls, and by erecting turnpike gates on the roads, to oblige traffic that passed that way to pay; for it was felt reasonable and right that those who used the roads should pay for them. In this way, many trusts were established in the country; and I think during that time, and for many years afterwards, Parliament seemed rather to have neglected to enquire whether it was advisable that any particlar road should be managed by a trust or not. They simply allowed a trust to be established when applied for; so that at one time there existed as many as eleven hundred different trusts in the country. On the establishment of a trust, the tolls were mortgaged for a certain number of years; and on this term coming to an end, it was re-allowed without any difficulty; but, of late years, all trusts whose original terms have expired are placed together under an Act passed yearly for that purpose, and are continued for one year and to the end of the next session of Parliament. So they go on from year to year until the debt of any one trust is paid off; and it is then put into the schedule of this Act, and ceases at the end of the year. Up to the present time, a good many debts have been arranged; but that has been done by reducing the rate of interest, and fixing a term of years in which the whole shall be paid off. There have been comparatively few cases in which the debts have been paid off, and the trusts have terminated altogether: but in an Act which was passed last July there are no less than 133 trusts named in the whole country which will cease—absolutely cease—by November, 1867, and the repairs of the roads fall on the parishes through which they pass, unless some alteration in the present law is made. This has, of course, led those who are more directly interested in these trusts to consider upon whom the burden of repairing roads will fall when gates are abolished. Under the present system, if these 133 trusts should cease, an injustice would be done to particular parishes; and it is well to consider it beforehand, and to try to guard against it. There are many such cases. Let us take one in this county. Leading from Gloucester westwards, there is a road which branches off, I think, to Ross, Chepstow, and Ledbury. It crosses the Severn by a bridge just at the entrance to Gloucester, and goes through five or six parishes, its whole length not being more than fourteen miles; but the whole of the traffic that enters the city on that side passes over that trust and over that bridge. That trust has been out of debt some years; and if the gates are done away with, and the repairs are thrown on those particular parishes, the result will be very serious. Of course, the inhabitants of the parishes strongly object to such a thing; and Mr. Gambier Parry, who is a large owner of property there, told me it would almost ruin him, as it would add £600 a-year to the rates of his parish. That gives you some idea of the injustice which might be caused if the trusts were abolished in that way, and the repairs were thrown upon a parish, without enlarging the district at all. If you take one trust in this manner, and abolish it without doing away with a neighbouring trust, you simply offer an inducement to people to leave the roads where gates remain, and pass over those where the gates are abolished (Hear, hear); so that the greater part of the traffic would be thrown upon roads where there were no gates, and the revenue of the other trusts where the tolls remain would materially suffer. You all doubtless know that there was a discussion on this subject at the last Gloucester quarter sessions; and Sir George Jenkinson brought forward a resolution urging the abolition of turnpike tolls, and the adoption of a county rate, adding that the debt which now exists should be paid by a loan from Government, on the security of the county rates. That was rather a sweeping proposal; and I do not think it quite met with the approbation of the court. The magistrates thought the question had hardly been sufficiently inquired into, and that it was rather too soon to adopt anything of the kind. For my own part, I think the more one inquires into this subject the greater the difficulty seems to be. It is almost impossible to do anything in this matter without causing some injustice or hardship to some one or another; and what we should try to do is to obtain that solution of the question which will cause the least (Hear, hear). With regard to the proposal of Sir G. Jenkinson, to place the roads on a county rate, I should like first to say a few words upon the present system of tolls. We often hear it said that tolls are doomed, and must be abolished. We ought also to inquire why they are doomed, and why they should be abolished? If the present system of repairing roads is denounced as the worst, we ought to inquire why it is the worst? I think that a few figures which I have put together with regard to the county of Gloucester will show you the reason for objecting to tolls. In this county, the sum actually paid to the trustees of the different roads is £40,000 a-year. To that I think we may add at least 6 per cent. as the profit which the lessees get out of the tolls. That gives a sum of £2,400 per year. We must also add the livelihood of persons living at the different gates, which we cannot estimate at less than £700 a-year. There are 285 toll-houses in the county, and it has been computed by the best authorities that they cannot return to the occupiers less than £25 a year each. These sums added to the £40,000 paid to the trustees makes a total of nearly £50,000 a-year, besides which £1,000 a-year is paid by the parishes towards the repair of the roads in the county, which increases the amount paid yearly to about £51,000. Now, out of that £51,000 paid annually for the maintenance of the turnpike-roads in this county, only £28,000 goes in actual repairs. You see it is little more than half. Of that amount £2,842 is spent in "miscellanies," which mean, I imagine, improvements, repairs to bridges, and other matters which do not strictly come within the contract for repairs. Then the salaries of surveyors and clerks amount to £3,242 a-year. But the main point I wish to impress upon you is, that while £51,000 is paid by the public for the repair of the roads, only £28,000 is devoted to that object. That at all events is sufficient to establish a paragraph in the report of a House of Commons committee, which sat on this subject in 1864, to the effect that tolls are costly in collection and inconvenient to the public. I am sure every one here can speak for himself of the great inconvenience of being stopped by a turnpike and a stupid pikeman on the road to the station when rather late for the train, or in returning home late at night (Hear, hear, and a laugh). On the other hand, it is only fair to consider a very strong argument in favour of tolls. There can be no doubt whatever that they catch people who ought to pay for the repair of the roads—those who use them. I will give you a strong instance of this. It comes from the evidence of Mr. Peach, who lives in Derbyshire, where there are a great many mines. He gave evidence before a Parliamentary Committee on this subject, and he stated that there was one colliery in his own district rated at £700 a-year, and which returned a yearly produce of 20,000 tons. Now, 20,000 tons passing through the turnpike at a toll of 4d. per ton produced £330, which amount he contributed towards the repair of the roads over which his coal passed; but substitute for the present system of tolls a 4d. rate, and, taking the rateable value of that colliery at £700, you would get only £12 a-year. Thus in one case the colliery owner would pay £300 a-year for the use of the roads, which he fairly ought to pay, and in the other case he would pay only £12. That is a very strong instance indeed in favour of tolls. But on the other hand, it may well be said that if you can prove that, although you raise a good deal more money from coal mines, and hauliers, and millers, and others of that class by tolls than by rates, yet if as much money as they pay can be saved by substituting a rate for tolls, and other classes will not be more burdened, surely it is worth while even in a case like that I have quoted to make the change. At a late meeting of the Gloucester Chamber of Agriculture the rateable value of several farms—as many as 20, I believe—was returned, together with the estimated amount of tolls which the occupiers now pay in a year. Now, I think we shall admit that the agricultural interest is one which, in such a case as this, we should be most anxious not to see over-burdened. One farmer at Hanley was returned as rated at £685 per year, and the estimated amount of tolls which he paid in a year was £6 10s. At a rate of 4d. in the pound a farm assessed at £680 would produce £11, so that the farmer in that case would be a loser by the substitution of a rate for tolls. On the other hand there is a farm at Lenton rated at £780, the occupier of which calculates that he pays £20 a year in tolls, but if a rate was substituted, he would pay only £13 a year, so that he would be a gainer by the change. The truth of the matter is this, in those parts of the country where there are many turnpike-roads—such as in the Vale—the substitution of a rate for tolls would probably in most cases be a gain to the farmer; whereas in parts of the country like this, where turnpike-roads are few and far between, and where the traffic is mostly carried on highways, it would probably be a loss. I have endeavoured to ascertain from several gentlemen here present the amount they pay in tolls in the course of a year, and I have no doubt they will make their remarks on the subject and state whether they think they would gain or lose by such a substitution. For my own part, I have looked into the matter—I don't occupy much of a farm, about 100 acres—and I find that I paid nearly £11 last year in tolls. I don't think I for one should lose by the substitution of a rate for tolls. There is another way in which it is suggested the roads might be supported if tolls were abolished. I have seen it argued in one or two letters in the *Gloucestershire Chronicle* that it might be possible to place a sort of assessment upon everything which used the roads, such as carriages, horses, carts, sheep, oxen, and so on; but I think you will all agree with me that such a plan as that would be impracticable and oppressive and inquisitive to the last degree, and could not possibly be adopted in this country (Hear, hear). The present assessed taxes are bad enough as inquisitive imposts, and if ever such an addition as I have mentioned was to be made to them, nobody would be more ready to complain than the gentlemen I see around me, and with great justice too (Hear, hear). There is another point which we must particularly bear in mind in considering this question. It is this: It would be impossible to take the turnpike trusts by themselves. When the question was first agitated, it never occurred to me that it would be impossible to put all roads under one system. If you take turnpike roads alone and put them on a county or district rate, the injustice would be enormous, for you would not only make parishes repair their present highways, but contribute also to the rate for the maintenance of turnpikes. The proper way to deal with the matter is to take the whole thing together, and put turnpike and highway roads on the same basis (Hear, hear). If this plan was adopted and a rate was substituted, you would have to put the whole management of all the roads under one board. You would have a certain number of districts in the county, each of which would consist of elected and ex-officio members, much in the same way as the present highway boards. From these certain members would be elected to form a central board at Gloucester, which would control the whole; in fact the whole would be managed much in the same way as the South Wales counties are at present. You are all doubtless aware that in the six South Wales counties, about 20 years ago, riots too place on the subject of the turnpike roads. Toll-gates multiplied everywhere, and people could hardly travel a mile on the road without confronting a gate and being called upon for toll. Everyone was justly dissatisfied, and the result was that the roads in each of these counties were consolidated into a county trust. I have obtained a return from Glamorganshire, and this is what they do there. Over the whole of the South Wales counties there is a general surveyor paid by Government, his salary being £1,200 a-year. Each county has a central board, and there is a board in each district. Glamorganshire is divided into three districts, and the central board meets about once a-year. That county is not nearly so large as this. There the mileage of turnpike roads is 235 miles; here it is 870 miles: so that here we should have more districts and a larger number of officers. But, for all that, I find that in Glamorganshire the cost of management is less in proportion to the extent than it is in this county. And that brings me to another proposal made by Mr. Curtis Hayward, which is more feasible than the other to which I have referred. It was to consolidate the whole of the trusts in the county into one large trust, which should be managed in the same way as in Glamorganshire. Now, I will just compare the expenditure and rates of the two counties, which will show you, I think, that the more you consolidate trusts the cheaper you can do them (Hear, hear). In Glamorganshire there are 235 miles of roads, the repairs of which cost £8,250 a-year. These roads are repaired under the management of a general surveyor paid by Government, and two county surveyors, one of whom receives £260 a-year and the other £210. There is a clerk to each of the district boards, and the salaries of these four clerks and two surveyors amount to £710 a-year. Thus the expenditure there amounts to this—for salaries, £710; for repairs, £8,250. In Gloucestershire there are 870 miles of roads, the repairs to which amount to £28,000 a-year. I really don't know how many surveyors and clerks these roads are managed by; but I do know this, that many of those in the Vale have a very small mileage indeed to look after. The salaries of these surveyors and clerks amount to £3,242 a-year; so that, in fact, although the Gloucestershire roads are about 3½ times as much in mileage, and cost about 3½ times as much to repair as the Glamorganshire roads, yet we pay 4½ times as much as they do to our own surveyors and clerks. That will show, I think, that a considerable reduction would be made by consolidating the roads in this county (Hear, hear). I have heard it objected that it would be unfair to consolidate trusts, because, in the case of roads which have no debt, and on which gates might be expected to be abolished, they would have to continue those gates at the expense of the inhabitants of the district, in order to benefit other districts where gates were not abolished on account of debt. No doubt that would be the case, but in the inquiries I have made I have found that the inhabitants of districts where there is no debt, far from being anxious to have their tolls and trusts abolished, would infinitely prefer to have them kept up, to avoid the very great expense they at present see before them if the roads are thrown upon the parishes through which they pass. Again, some trusts may say, "We have allowed the tolls to accumulate for several years with a view of paying off our debt, and have repaired the roads with the rates of the parish, and we think it is rather hard that we, having done this, should have to pay for other turnpikes for a much longer time than we expected to do." Now, as far as I know, there are only two or three trusts in this county which are in that position, and supposing the wheol trusts were consolidated, I see no reason why such trusts as those at Bibury and Wooton Bassett should not be treated as turnpike roads and included in the consolidation. Next comes the question, if you consolidate the roads, whether you would pay off the debts by tolls or by a rate? I am inclined to think it would be better to consolidate them and keep on the tolls till the debt is paid off. I don't think it would be fair or right to charge the county with the debt incurred for making these roads (Hear, hear). At the time they were made, many of them were imperial highways, not made for the purposes of local traffic, and I repeat that I do not think it would be fair to put upon a local rate (which, after all, a county rate is) the original expense of making these roads. After the debt was paid off there would be infinitely more reason for putting the repairs of the roads on the county rate, for no doubt the traffic upon them now is purely local. As I have said before, by tolls you to a certain extent catch those who are not ratepayers, but use the roads; and if the trusts are properly managed and consolidated, so as to be administered in the best way at the least posble expense, I believe that in a comparatively few years—say ten—the whole of the debt of the county would be paid off, and in the meantime some better plan might be devised for the future maintenance of the roads. But supposing, on the other hand, that a rate was adopted as the best means of paying off the debt, no doubt it would be done by borrowing money from Government on security of the rates. Government could afford to lend money at a less rate than the trusts at present pay to their bondholders, and so far we should reduce the debt in a way which keeping on the tolls would not do. I am endeavouring to put before you every argument, as I wish to look at the subject in every possible light, and to have your views upon the whole of it (Hear, hear). We now come to the amount of the county debt. I have gone into statistics as well as I can, and I have particularly noticed the calculations which Sir George Jenkinson made at Gloucester; and, so far as I can see, he is about right in placing the county debt at £130,000, excluding the debt on the bridges, the actual money value of which, however, was considerably less. Then from that amount we have to deduct £20,000 due to Government, which I don't think they ought to get, so that the actual money value of the debt is not more than £90,000. Out of that £90,000 we have to take say £15,000 for toll houses and gates, and the *boná fide* debt of the county is thus reduced £75,000. Well, now, seeing that every year we collect by tolls and contributions from parishes £41,000, and only spend on actual repairs £28,000, I really think we might hope, in less than ten years, to pay off that debt of £75,000. There is another point which I have not yet mentioned, and to which I ought to allude before I conclude. Under the present system of tolls, towns pay considerably towards the repairs of the turnpike roads; or if the townspeople don't pay, they are stopped by the turnpikes, and they cannot travel. Now, if you adopted a system of rates instead of tolls you would not catch the towns at all. I am aware that Cirencester and Cheltenham are both liable to the county rate, but I don't think we could in fairness ask towns to repair their streets, and to repair in addition, equally with the rural parishes, the repairs of the country roads. That is a large instance; but there are other cases where the system of a county rate as at present levied would hardly apply. Take the cases which Mr. Rolt gave at Gloucester. A haulier who was now estimated to pay £20 a year tolls would under a rate pay 2s. A miller perhaps may pay now £40 or £50, but he would not pay more than £2 or £3 under a rate. A gentleman living in a house in the country for purposes of hunting, without occupying any land, would pay now a very considerable sum in tolls; but if a rate was substituted he would pay a very small sum indeed, as his house would probably not be assessed at more than £100 a-year. There is also the case of quarries, coal mines and iron mines—the latter of which are not rated at all. All these cases tend to show that if you put the roads on a county rate, you must alter the present basis so far as highways are concerned. I don't think you can with any fairness repair highways by a rate levied under the present system. Why not rate each description of property in a different manner? Take the farmer as a unit to start from; put him at the same amount as he appears in the poor-rate; put the haulier and miller at several times the amount of their rateable values for the poor-rate; and assess mines and manufactories in the same way in proportion to the wear-and-tear of the roads which they occasion. I don't see that such an arrangement as that is impossible, and I am sure it would be infinitely fairer than putting on the agricultural interest more than ought to be borne by it (Hear, hear). In conclusion I have only to say that I am much obliged to you for the patience with which you have listened to me. I have endeavoured to go into the whole question, to explain to you the difficulties which beset every method of dealing with it, and to show you as far as I could the arguments for and against any particular mode. I shall only be too happy now or at any future time to hear anything that any gentleman has to say on the subject, and to endeavour with you all to consider what are the best means of dealing with this very difficult question.

After explaining a point raised by Mr. Warner, Sir Michael stated, in reply to the Chairman, that the amount of debt paid off last year in the county was £4,840.

Mr. T. C. **Brown** stated that owing to the peculiar circumstance of deafness he had not heard a word of Sir Michael's address, and he thought therefore, as he had a few words to say on the general question, that it would be most convenient for him to say them at first, and not interrupt the discussion afterwards. The question was, he believed, as to the advisability of altering the present system of repairing the roads by turnpike trusts. Now, for the greater part of his life he had been a commissioner of a large trust in this neighbourhood, and therefore to some little extent he had seen the working of the present system. He thought he might say at the outset that they would all be agreed on one point—namely, that if it would be possible to devise a scheme for the repair, not only of turnpike roads but of all roads, so as to do away with the toll-taking system and make the traffic entirely free, it would be a very desirable arrangement. But looking at the present system, he thought they would be all equally agreed that it seemed to be based on most reasonable grounds—that was, of making those parties pay for the repairs who used the roads (Hear, hear). That seemed a very just principle, and unless some scheme could be devised by which the burden should be so diffused as not to fall upon particular individuals or parishes, he thought they had better remain where they were. But he was quite aware that they could not stay where they were. They were in a difficulty, which was this—that this reasonable mode of repairing the roads was imperfect and insufficient, and the consequence was that year by year turnpike roads were coming to a natural end, because they had not the means of repairing them. Now, it seemed to him that what they had to do was to look at the general features of the question. If they were agreed that something ought to be done, they must first consider the state they were in, and then how they could best improve it. One part of their present position was this, that money had been borrowed to make these turnpike roads. Now, Englishmen, he believed, loved honesty, and any scheme that did not provide for the repayment of those borrowed moneys in proportion to their value—their value might be estimated by the amount of interest they bore—ought not to be adopted. He thought the basis of any alteration they proposed to make should be this—that justice must be done. It had been advocated that a county system should be adopted and tried in Gloucestershire. Now, he saw the greatest difficulties in the way of a county system, and he would never be a party to any proposition to introduce a departmental scheme (Hear, hear). Let the system be national (cheers). If it were national, they would all be bearers of the burdens in proportion to their property. He could not there enter into details; but he believed that any system that was not national would fail, and what he wished to submit was that if that meeting took any step towards recommending any alteration, it was most desirable that they should proceed on a sound basis, and he repeated that his opinion was that the only sound basis was a national one. He thought it was most undesirable that they should go to Parliament to suggest merely local alterations.

Mr. David Bowly said he came there to be enlightened, but he must confess that he was not so at present. He was as much in the wood as ever, and he at present saw no way out of it, except, as Mr. Brown had suggested of going on as they were. The legislation had for the last 20 years or more had all been with a view of abolishing turnpike trusts. That was seen in the case of their trusts here. It must be a very strong case indeed that would induce Parliament to renew a trust, and the object was to throw the cost of the roads upon land. As for a county system, he could not see how that was to work with any sort of fairness, for, as Sir Michael Beach had stated, it seemed a hard thing to put a heavy county rate upon towns which did not use the roads. Many shop-keepers did not go a mile in the year on the roads, and it did not seem fair that they should be called upon to contribute towards the repair of them. What decision that meeting would come to, he did not know. For himself he could see no way of acting at all, and he should never support anything like going for a county rate.

The Chairman could not agree with his brother as to putting all the expense upon land. Why, shop-keepers used the roads more than farmers. Never a day passed—Sundays more especially—but what large numbers of vehicles of all kinds, driven by towns-people, passed his house, and why should they be exempt? As to their parish, they took little interest in the matter, as they had to make all their own roads, and they could not be worse off.

Mr. David Bowly: There is not another parish in the county where the roads are used as ours are.

Mr. G. F. Newmarch remarked that as he had given some attention to this subject, perhaps they would allow him to make one or two observations upon it. Going back to the time when there were no such things as tolls, they were no doubt all aware that the common law placed the liability to repair the roads upon the parishes. The present feeling of the public mind seemed to be that if these toll-gates were abolished they would revert to the original law. Then of necessity, each parish would have to maintain its own roads, which in some cases would be a very great hardship, as he would endeavour to explain. He was clerk to Northleach district roads and some time since he was called upon to give reasons, pro and con, why, that trust being out of debt, it should or should not be continued. He received a circular from Government, and he made a reply to it, which seemed to have effect, as their trust was not discontinued. He would tell them the grounds why, if the repairs of roads were thrown upon parishes, it would press very hardly on that particular trust, and the same reasons would apply to others if tolls were abolished. It would of course depend on the area of a parish and the amount of road in it. Take two particular parishes in the Northleach district. Hampnett, which had a rateable value of £1,592 per year, would have to pay for the repairs of turnpike roads £58 10s. a-year, while Withington, whose rateable value was £5,095, would only have to pay £12. Again, Dowdeswell, with a rateable value of £3,053, would have to pay £14 5s. a-year, while the two Shiptons, whose rateable value was £2,553, would have to pay £74. That arose from the fact that, in Hampnett for instance, the greater part of the roads were turnpike, while in the other parishes they were mostly common highways. This instance would show the difficulty of dealing with this question. If they put a road hitherto kept by toll upon a parish, they would seriously shift the incidents of taxation, and, as he had said before, revert to the original common law. He thought the debt question had been rather a bugbear, and when people flew off upon that they looked to the minor point and, left the major. If, to start with, they reduced the debt to what it was worth, and then distributed it over 30 years, they would for about £3,000 a-year pay off the entire debt of the county. Therefore the debt question, if they went into it, would be but a small one. The great question was the question of repairs. If, as he said before, they came to the common law, and forced each parish to pay for its own roads, they would so shift taxation that in some cases it would be very grievous injustice. It was upon that ground that he made a suggestion some time since which he had no doubt was not appreciated, and he hardly ventured to hope that it would be now. It was to the effect that the common law might be modified so that, through the medium of the Quarter Sessions, a sum should be raised in a parish which should vary as the Quarter Sessions felt that the justice required. Why could not this be done? They did it now with regard to the land tax, a certain sum of money being fixed upon a parish which it had to raise? He ventured to make that suggestion before a Committee, but, as he before remarked, the Committee did not seem to appreciate it, nor had anybody since done so. He had now ventured to make the suggestion again, so that it might be ventilated; for these things, if they were at all out of the common way, were not very readily taken up at first. The public mind, accustomed to run in a certain groove, found it a rather difficult matter to travel out of it, and it was only by hammering on that they could get people to look at points which they had never contemplated before (Hear, hear). For this reason he had thrown out this suggestion again as one mode of getting rid of that inequality between parishes to which he had referred. Let some local body—say the Quarter Sessions, as their local parliament—assess the sum which each parish should pay to the common fund for the maintenance of the roads, and if they did this, he should not see so much objection to throwing the roads together. Another course was to throw the roads on the highway district, which would be a great improvement, and he was almost inclined to think that was what it would come to. The question of debt could be easily dealt with, and then, according to this proposal, all ordinary roads would be thrown upon the highway district. There could be no question that that would get rid of a deal of inequality, but at the same time they must bear in mind that it would throw a very large extra burden on land. It was for them to consider whether this would or would not be fair, and whether there were any circumstances which rendered it necessary that landed property should bear these sort of burdens. He was speaking then in an atmosphere of land (a laugh), and to suggest the putting of any extra burdens on the land would not meet with approval there, nor was he going to suggest it. He had no hesitation in saying that land in this country bore burdens for which those who owned and occupied it did not seem to gain the credit which was due to them (Hear, hear), and to increase those burdens was not his object. But they must look the thing fairly in the face. If they were to get rid of the present system of tolls, in one way or another they would get an increased burden on the land. Whether that burden should be fairly distributed by extending the area, or unfairly imposed by leaving each particular parish to bear its own burden, was a matter which demanded their most careful consideration.

Mr. ILES said however they looked at the matter it was fraught with difficulty. There were many parishes which had not a single inch of turnpike-road, but which had roads of their own to maintain; and if tolls were abolished, he thought it would be rather hard that parishes like these should have to repair their own roads and contribute towards the maintenance of turnpikes as well (Hear, hear). It would also be hard to place the roads on the parishes through which they passed. The matter might be met by a tax upon vehicles, horses, &c.; but it seemed to him that the better plan would be to throw the roads on the parishes, each of which should receive some contribution from the county or other rate, thus making a compromise of it. With regard to towns, no doubt something was to be said against making them contribute towards the repair of turnpikes, in addition to maintaining their own streets. But he could not agree with what Mr. David Bowly had said as to shop-keepers. If there were not good roads people could not come to town to buy as often and in such numbers as they did now. The fact was that all were interested in the maintenance of good roads, and he thought that if in any way they could compromise the present question, it would be the fairest way of dealing with it.

Mr. DAVID BOWLY said it should be borne in mind that towns maintained their streets and all the roads round them, for the benefit of the public, without any assistance whatever from any turnpike trust or anything else. That being so, was it fair to go two miles out of the town and compel a shopkeeper to pay for the repair of a road which he never used, when he had to keep the town in repair for farmers to hold their markets in, and country people to make their purchases? He was as much for the landed interest as any one present, but he did not wish to see an injustice done to towns. He believed that land was unfairly rated with regard to roads. They had three miles of road thrown on their parish, by whom it was entirely repaired, and he ventured to say that more wheels passed over that road than over any other three miles in the district. As he had said before, any man must be blind not to see that, most unfairly, he submitted, the legislature had been endeavouring of late years to throw the roads on the land. Every Home Secretary for the last 40 years would say the same thing. If that was not the object of the Government, why did they limit a trust for a certain term of years on the expiration of which the parish through which the turnpike ran had to maintain it. The system was oppressive, and what they had to do was to endeavour as far as possible to get rid of it, and to avert any additional burden.

Mr. THOMAS ARKELL, of Penhill, gave some particulars with regard to the Burford, Lechlade, and Swindon Trust, of which he was a Commissioner. Some years ago it was one of the worst-managed trusts in the country, but in 1853 a better Act was obtained, limiting the interest to 2½ per cent., and after fixing the salaries of officers and the cost of repairs, they began to pay off the debt, and met with such success that it almost frightened them (a laugh). They first compounded with bondholders at a considerable reduction, but the trust was in such a good state now that they were almost paying in full. Now, after making that stir for the benefit of the public, and paying off their debt, they found this staring them in the face—the proposal that they should keep the roads and pay for repairing them. He agreed with Mr. Brown that this could not be merely a Gloucestershire question—it must be national. How could they fix a county rate for a trust that went through three counties? After referring to the management of the trust with which he was connected, Mr. Arkell stated that in 1836 the debt on turnpike roads throughout the country was £7,000,000, but by 1864 it was reduced to £4,000,000, the estimated value of which, however, was not more than £3,000,000. This sum might be liquidated in 25 years by an annual payment of £180,000, which seemed a very moderate sum if taken in hand by Government. But the question was how was this £180,000 to be raised without putting it on their shoulders or going to the land to repair roads? He was of opinion that it would be very beneficial to do away with tolls, as they merely held out a premium to people to go roundabout for miles and wear out the roads in order to save sixpence. But if turnpike trusts were abolished, it was right to consider what would be the consequence to them? They ought to feel much obliged to Sir Michael for coming there to obtain their views on the subject (Hear, hear). He was a pattern to their (North Wilts) county members, and he would take care to give them a hint on the subject. But as to the means. How, in the event of the abolition of turnpike trusts, was the money to be raised so as to keep it off their shoulders and the land (a laugh). They were quite willing to pay their share; but he thought that when magistrates got to Quarter Sessions and talked about "only a penny county rate," they did not seem to think that a county rate was laid on the same thing as a poor rate, and that a penny county-rate was equal to a twopenny income-tax upon them. Now, he had turned this matter over in his mind for some years, and his impression was that they must come to assessed taxes, and that was the only point on which Sir Michael and he did not concur. Mr. Arkell quoted figures to show the amount that would be realised by assessed taxes, and compared with this the proposed rating system, under which certain persons using the roads would be comparatively exempt, and the land would have to make up the deficiency.

Mr. DEWE remarked that when they spoke of assessed taxes they were touching on rather ticklish ground. If they opened this question, it might be asked why should not farmer's carts, farm-horses, &c., which were now exempt, be assessed, and they might thus put themselves in a rather bad position.

Mr. ARKELL said he was not wishing to have cart-horses put under the assessed taxes; but if they would take the rate off his farm he would be quite willing to pay in proportion to his stock.

Mr. ILES thought if Mr. Arkell's proposal could be carried out it would be a very good one.

Mr. SMITH, of Bibury, said this discussion seemed to be directed towards removing turnpike gates, but there were other gates which were as great a nuisance as turnpike gates. Perhaps in going to or from home they would, in five or six miles meet with five or six gates; and what was so great a nuisance, especially if they happened to be driving a fidgety horse (Hear, hear)? For his part he should like to see all the gates taken off all the roads, and then he should be willing to contribute his portion towards repairs. They had recently taken the gates off the Bibury turnpike-road on their own responsibility (though some people said their trust did not expire till November, 1867), for they found, on making a calculation in the eight parishes through which the road ran, that they were called upon for an annual contribution towards that road which exceeded the amount expended upon it. So about two years ago they took to the roads themselves, and they were convinced that they were now repaired at less cost and more efficiently than formerly (Hear, hear). Some people had blamed them for taking off the gates, for they thus allowed travellers who used the roads to go without paying towards them; but they found that the road, as at present managed, was the least expensive, and surely it would be very unwise to put up gates again and increase their own burdens simply for the purpose of catching stray traffic (Hear, hear). Their roads were free, they worked well, and he hoped he should live to see all gates of all kinds entirely abolished (Hear, hear). He expressed a fear that Mr. Arkell's plan as to putting assessed taxes on road-traffic was too complicated to be carried out.

Mr. GARNE said some gentlemen seemed to have a great objection to having a turnpike road thrown on a parish; but since the turnpike roads in his district had been thrown on the management of the highway board, he found that he contributed less money and the roads were better maintained than when he paid tolls. Their roads, since they had had the management of them, cost them much less than before, and he was satisfied that last year as much stone was put upon them as in five years previously. Let them have anything in the world but the roads thrown on the county, with a county surveyor, a county manager, a county clerk, and a county this thing and another. Rather than have that, they had better put up a few extra gates instead of abolishing the existing ones.

The Rev. THOMAS MAURICE asserted his belief that roads coming more and more upon parishes was inevitable, and he exhorted all who were interested in the matter to take all the pains and care they could to have those roads put in tolerably good order before they were so transferred.

Mr. Warner asked Mr. Garne the acreage and the extent of turnpike road in his parish.

Mr. GARNE: The acreage is about 6,000 acres, and the extent of turnpike road 2½ miles.

Mr. THOMAS BREWIN said he admired the manner in which Sir Michael Beach had brought this subject forward. He had not dogmatised at all, but had laid the whole question before them, in its various aspects, and having stated the whole case, had left them to form their several opinions upon it (Hear, hear). He (Mr. Brewin) expressed approval of Mr. Newmarch's plan of throwing the roads on the highway district on the whole of which a rate would be charged, not in the exact ratio of the county-rate, but modified as the justice of the case might seem to require. For instance, Cirencester paved and lighted the streets, and it would be hardly fair to rate the whole of the property in the town the same as in the adjoining parish of Baunton, which did nothing of the kind. As to the present turnpike trusts, raising money by that system was a bad one. He thought they were pretty well agreed upon that. Then as to having a mere partial system of turnpike tolls, in his opinion that would be worse than a general one, because no sooner would gates be pulled down in one district than people would travel miles out of their road to avoid paying the tolls which remained, and looking at the loss of time and the wear and tear of roads and material which this would occasion, it would be found to amount in the year to a great national loss. With regard to the debt, it was a bad thing to be in debt, but worse to try and get out of it without paying (a laugh). He thought the way in which turnpike bondholders had been treated was not just. It had been more like Yankee repudiation than anything else. It was not so enirely, but advantage had been taken of the bondholders, whot had made fine roads for which they had never been really paid, and all that was left for them to do was to attack a body of road commissioners with the Home Secretary at their back for 20s. in the pound. And what was the use? He should not be a bondholder long—he hoped soon to be paid off; so he was not speaking from a personally interested point of view; but he could not help saying that English legislation with regard to turnpike trusts had not been an honour to this country. If the tolls were insufficient, they would be content to go unpaid; if they were otherwise, then those who lent the money on the tolls were entitled to a priority of them. He thought the payment of the debt would not be a very great practical difficulty. It was not very large—nothing at all compared with the burdens of continuing turpike trusts. After some further remarks, Mr. Brewin concluded by expressing an opinion that it would be found less expensive to maintain a good road than a bad one. He had been a surveyor, and he was satisfied of this. Give him a contract for twenty years, and for his own sake he would have the best possible road.

The CHAIRMAN observed that he had not the same compassion for bondholders, who had of their own free will put their money out at interest, and they must accept the consequences. Looking at the importance of this subject to them at the present time, he suggested whether it would not be advisable to adjourn the further consideration of the question till next month, and at the same time appoint a committee to confer with the Chamber of Agriculture upon it. He hoped every farmers' club in England would do this. If they were to save themselves from further burdens, now was the time to act.

Sir MICHAEL BEACH said, if no one else wished to continue the discussion, he would like to say a few words in reply. He felt that they had done that day the right thing. He was glad that he had come there to open the discussion, as the subject seemed to have excited much interest, and many valuable suggestions had been made. First, in reply to Mr. Brown, he would state that in his speech he was careful to guard himself against any such thing as suggesting repudiation. Certainly, in no part of England would such a suggestion be less favourably received than in Cirencester, where, he was informed, it was difficult to find creditors to take the debt at a discount of five per cent. If that was the case, no bondholder here had any need to complain of repudiation. Mr. Brown also stated that what was done in this matter should be done in a national way. He (Sir Michael) hardly understood what that meant. If it had reference to something given out of the Consolidated Fund, he devoutly wished they might get it; but there was a large party in Parliament who were always glad to put any burden upon roads, for they knew it fell upon land. He had not much hope of receiving assistance from the Consolidated Fund, which was levied to a great extent on personal property. Mr. Bowly urged that towns ought to be excepted, because they made their own roads. He (the hon. baronet) would be willing to show them some consideration; but they should contribute something. Mr. Newmarch's proposal was that they should take the highway district in lieu of a county-rate. It was also objected that gentlemen here would strongly disapprove of being rated for turnpike-roads in the same area and the same rates as the district round Bristol. That was the very point which he tried to press upon the meeting. If mines and manufactories were rated fairly and properly, according to the way in which they used the roads, no one could object to be classified with them. Mr. Iles said it would be a hardship to make parishes with only highways repair their own roads and help to make turnpikes as well. He, for one, would not propose such a thing for a moment. All roads must go together. It was impossible to deal with them in any other way. He could not agree with Mr. Arkell's suggestion as to increasing the assessed taxes; and Mr. Dewe's answer was a very good one. It would raise the whole question of taxing agricultural horses and carts, and other things which were now free. Oxen would also be taxed. Indeed, they could not raise the assessed taxes for the repair of roads without taxing every animal and cart which used them. Mr. Smith and Mr. Garne instanced the road at Bibury, and stated that the parishes through which that road ran did not object to bear the whole expense of its maintenance. He would like to know what that road cost a mile to repair. [Mr. Smith: "Under £12."] That was very little more, if anything, than was paid for the maintenance of any highway road in any parish. This was why Bibury and the other parishes did not object to take the burden upon themselves. It was a mere local parish road. In contrast to this, he might instance the case of a trust near Gloucester which cost £78 a mile to repair it. In some cases, it cost £250 per mile; but £78 was the average. He thought if Bibury had to pay that, they would object to take the road wholly upon themselves. Having answered the more important points raised, he would state, in conclusion, that the question resolved itself into this—the great objection to tolls as at present collected was the enormous waste that was occasioned, and the inconvenience to those who passed over the roads. One point in favour of tolls was, that they caught the people who used the roads; but was it not possible to do this by a rate? If a rate could be so formed as to catch the people who used the roads in proper proportion to that use, then he thought no one could object to the substitution of a rate for tolls (Hear, hear). It might possibly be done by rating mines and manufactories at three or four times their poor-rate value; but he certainly should not like to see roads put upon the county-rate without some alteration being made in the present rating system (Hear, hear). On one point, he thought, they were all agreed, which was that land was sufficiently burdened already (Hear, hear). They paid more in proportion for real landed property than personal property paid. It was a large question to enter into. Last session, he moved for a return of the amount paid in rates throughout the country, and the annual value of the property that paid it; and, side by side with this, he moved for a return of the annual value of property on which income-tax was paid. When these were presented, he thought they would show a very severe burden indeed upon land and real property (Hear, hear). He again cordially thanked them for their attention.

Mr. THOMAS ARKELL proposed a vote of thanks to Sir Michael for his kindness in coming to lay before them the important subject which he had so ably handled that day.

Mr. ILES seconded the proposition, which was carried with acclamation.

The hon. baronet expressed his acknowledgments; and a committee consisting of the following gentlemen was appointed: Messrs. E. Ruck, H. Playne, C. Hobbs, R. Iles, W. Slatter, W. Smith, R. A. Anderson, G. Hulbert, W. J. Edmonds, J. Plumb, T. Warner, W. Garne, J. Kearsey, H. Howell, and J. Barton. Mr. Ellett, secretary to the club, was appointed secretary to the committee.

THE POTATO TRADE AND MARKETS.

BY A PRACTICAL FARMER.

The immense quantity of potatoes which are now grown for the British public makes it a very prominent crop in modern agriculture. The breadth planted in the United Kingdom exceeds, if I mistake not, four million acres, and most of this large breadth is cultivated in the highest style for this now popular crop. The amount therefore produced is very large, and very valuable, the prices at the present time ranging from 70s. to 150s. per ton. This being the fact, it behoves all growers to exert themselves to place the potato trade and the potato markets upon a fair, sound, and satisfactory basis, so as to ensure to them, as the producers, their legitimate profit or share in the proceeds. I will shortly state the courses usually pursued in carrying on the trade both in the country and in the consuming markets, together with some other collateral matters. In every district where potatoes are extensively cultivated there are plenty of potato merchants; and in every consuming market there is a superabundant number of potato salesmen. The grower has his option of selling at home, or consignment to a potato salesman. If he prefers being his own salesman, he makes an offer to a country dealer. If a bargain is made, the dealer sends his own agent to dress the potatoes, at the expense, generally, of the seller; this is the first difficulty to be got over. The buyer will, of course, endeavour to make the sample as good as possible: the seller is dissatisfied at the amount of waste. The buyer can always recoup himself in some measure, of a bad or dear bargain, by extra dressing; besides, he can frequently obtain a little favour from railway companies in respect of carriage, provided he undertakes to send a given quantity or amount of tonnage; he can therefore, in the main, owing to these favours and salesmen's aids, give a price higher relatively than the salesman can usually make; but the grower must take into account this extra dressing and consequent waste, which is often considerable. He has also to deliver the potatoes to the place of transit, be it either by railway or shipping, the dealer generally finding sacks or bags in which to deliver them.

I have been a grower for many years to the extent of about fifty or sixty acres annually. I consider it my best course to send to the consuming market on my own account. The extent of land and quantity grown are worthy the close attention of the salesman, who will put me upon the footing of a merchant, and we can dress them when we like and as we like; growers of limited quantity had better sell at home. Potatoes, for the most part, are sold in the country by the sack of 2 cwt. each, but occasionally by the ton, to be taken up when and as specified in the bargain. As soon as they are delivered payment is due, and generally in cash, which is usually paid with punctuality, and the transaction is finished.

In sending potatoes to the consuming market—London for instance, which, in fact, is the potato market—there are many things to be considered:—The integrity and responsibility of the salesman; his commission; cost of "working;" waste; delivering from station; carriage by railway or otherwise; place of sale; time of year, or danger from frost; in sacks or loose in trucks; kind or sort to send. *The Salesman:* Mind that he is a thorough man of business, of high character, and not a merchant or speculator in the trade. Many salesmen are large buyers; this must militate against sales for employers on commission—avoid these salesmen. *Commission:* This is very important, and deserves a word more. The usual commission on sales is 5s. per ton; this is too much, as I will show. Take fat cattle at the Metropolitan Market, they will average £25 each, commission 3s. 6d. per head; sheep to average 60s. each, commission 6d. per head. Wheat, and other grain in proportion, average 60s. per qr., commission 1s. 6d. Potatoes average 80s. per ton, commission 5s. The per-centage commission in the £ is about 1½d. for cattle, 2d. for sheep, 6d. for grain, and 1s. 3d. for potatoes. There is no commission paid by the farmer so high as his potato sales commission. It calls loudly for mitigation: no wonder we have so many salesmen. It is manifestly wrong for the grower to pay from 25s. to 30s. for the sale of a single truck of potatoes. They must insist upon a reduction of at least two-fifths of this charge. *The Working:* This is also an extra charge, generally amounting to some six or seven shillings per truck, *Waste:* This is one of the most objectionable things connected with the trade. We send ample weight; but it never holds out. Do the salesmen's workmen claim certain injured or unsightly tubers as their perquisites? *To send in sacks, instead of loose in trucks,* would, and does in a great measure, obviate this. *Delivery:* The cost in this item is chiefly in accordance with the proximity of the station or vessel to the sale market. At the Great Northern Potato Market there is no extra charge, as the trucks all run into the market. But in the Borough, Spitalfields, Covent Garden, and other places of sale, the delivery charge is heavy, according to the distance. *Carriage by Railway:* This is a very important item connected with the potato trade, and requires alteration. Take about 100 miles of carriage by railway—a ton of wheat, worth about £16, is carried for about 12s.; a ton of potatoes, worth about 80s., costs the like amount; a ton of coals about 4s. 6d.; a ton of stone, bricks, gravel, &c., about 4s. 2d. *Potatoes should not cost more than one penny per ton per mile,* and they will leave a handsome profit at that rate. Such heavy carriage as potatoes should be put upon heavy-carriage rates, or nearly so. *Place of Sale:* This is a point for consideration. It is dangerous in frosty weather to send to any exposed market; rather send to good warehouses. The Great Northern Market is objectionable in bad weather, or a crowded trade. Time is kept according to certain regulations, so that bulks must be sold or be removed, and the warehouses are cold. *Time of Sending:* This must depend upon the grower's convenience in a great measure. It is always wise to send so long as prices are good, never heeding the chances of a rise. It may be prudent also to refrain sending in the severe weather of December, January, or February; but this must depend upon circumstances, which the grower's judgment must decide upon. *Kind of Potatoes to send:* The varieties cultivated are so many and various that they are adapted much to certain seasons of the year. The early sorts, such as the ashleaf, early kidney, &c., &c., will, of course, be forwarded between July and October. Then follow the dalmahoys, regents, rocks, flukes, &c., &c., for the winter's supply. As the spring puts in, the red regents, the skerry blues, late reds, &c., &c., and rocks, are best adapted, and are really capital sorts, outrivalling the regent and fluke.

In this way a more equable supply may be kept up of good *eatable* sorts. It is wrong to send the watery varieties before spring puts in; they are sure to meet a bad sale. It is to little purpose to bring these matters before the farming public, unless they will take them up, and at once have them removed. If some salesmen will not reduce their charges, try those that will, or establish others from the different localities where many potatoes are grown. It is to be done; but if growers are indifferent, it never will be. As to railway charges, there may be more difficulty in prevailing upon the traffic managers of these companies to yield; but the hardship ought to be frequently brought before them in a way likely to be attended to. In fact, the carriage of potatoes goes largely into the calculation of very many farmers, who object to grow such an expensive crop, and consequently a much less breadth is actually grown, which of course accounts for the high price they are now making.

OUR WATER SUPPLY.

A supply of pure water for domestic and other purposes is so essential to the preservation of health and the promotion of comfort, that one would suppose there was no occasion to use any argument to recommend it to public attention. Such, however, is not the case; for so general is the neglect of the means for insuring it, and inattention to the quality of the water consumed, not only in the metropolis, but throughout the country and especially in the cities and large provincial towns, that it has been deemed advisable to appoint a Royal Commission to inquire into, and make a report upon the subject, and upon the facilities afforded by the rivers, lakes, or springs existing in the vicinity of large populations.

It apppears to be the general practice of the companies or corporations who supply the water, to keep two points steadily in view, namely, to obtain the supply at the nearest source, and to restrict it as much as possible in its distribution to individual houses. The former has been the subject already of legislation, so far as the metropolis is concerned; and the water companies are no longer allowed to supply their customers with water from pipes actually opening within a few feet of a common sewer, as was the case some twenty or thirty years since. The legislature compels them now to go a certain distance to obtain the necessary supply; and they are moreover compelled both to filter the water through a bed of sand or gravel prepared for the purpose, and also to arch over their reservoirs with brick, so as to prevent the casting of dead cats, dogs, and other abominations, into them. So far, therefore, a great improvement has been effected and our tanks are no longer reservoirs of a poisonous liquid, alive in warm weather with animalculæ too disgusting and horrible to be drunk by any animal such as live on corruption. But with regard to the amount of the supply to individual householders, there is still abundant cause for complaint so far as the poorer neighbourhoods of the metropolis are concerned. Revelations on this subject have been made of the state of the water supply at the East end of London that reflect the greatest disgrace both upon the water companies and the proprietors of houses, who seem to have been in league to limit the quantity of water to each house far indeed below what health and cleanliness absolutely require. In cases of fire also it is frequently found that a difficulty exists of obtaining a supply of water because it has to be turned on upon the main, and the turn-cock has to be found; so that premises are, in many instances, past saving that might have been rescued but for the delay.

The two principal objects, therefore, that the commission must keep in view are, the source from whence a supply of pure water may be obtained, and the quantity that such source will yield to any given community. We are well aware that the first thing a corporation or a company will look at and take into consideration is, the expense involved in fetching water from a great distance. If left to themselves, this question will rule their operations; whilst that of having it from a perfectly pure source and free from the possibility of pollution will be made a secondary, or no question at all beyond what the metropolitan water companies practise at present. To have pure water that requires no filtering, because it is fetched from a long way into the country from a pure source, and preserved from pollution in its course by artificial means, if not beyond the comprehension, is sedulously avoided by the water companies of the metropolis, and, so far as we know, by those of the provincial cities and towns. If they wish to have an example worthy of imitation in this and all other respects, we would refer them to the history of the Croton Aqueduct, by which the city of New York is supplied with a superabundance of pure water. A short account of this noble and most beneficial undertaking will, perhaps, be interesting to our readers, whilst it must be instructive to the Royal Commissioners, if they would take it for their model, as it is described in the American publications.

The Croton river, or stream, rises amongst the mountains that overlook the river Hudson, and for some miles of its course consists of a series of small lakes, which probably received other similar springs. This stream was proposed by a person whose name has not, though it ought to have, been handed down to posterity. It was about the year 1833 or '34 that the suggestion was made to the New York authorities to form an aqueduct for the conveyance of the whole of the Croton lake to that city; and the proposal was at once acceded to by them. The requisite Act of the Legislature was obtained, so that in 1837 the work was commenced; and on the 27th of June 1842 it was completed, and the water was admitted from the Fountain Reservoir, in the highlands, forty miles from the city, into the whole length of the aqueduct to the Receiving Reservoir, which is now within the area of the Central Park. On the 4th of July it was admitted into the Distributing Reservoir, and from thence to every house in the city. The cost of this magnificent work was 12,000,000 dollars, or £2,400,000 sterling, and the aqueduct is, in fact, a tunnel throughout its whole length, so that there is no possibility of its water being in any way polluted. The surface of the Fountain Reservoir is 166 feet above the tidal water at New York at mean tide, and having a fall of 47 feet in reaching the receiving reservoir at that city, and in the distributing reservoir the water is 115 feet above the level of the mean tide, which renders it available to the inhabitants in every part of the city. In fact, so plentiful is the supply of water, and so small the expense to the householders, that every house is *on the main*, having an abundance of pure water at all times to the very top storeys, and that at one-half the expense paid for the very limited supply to the inhabitants of London. A friend of ours, who occupied a house that would let here for about £70 a year, but the rent of which was nearly double that sum in New York, paid only 36s.

per year for this never-failing supply of water; for, the longest period of drought, which in that country is sometimes very severe, has never sensibly reduced the supply below the requirements of the population, the quantity at present used being 770 million gallons daily, besides 50 million gallons taken from the river, making an aggregate of 820 million gallons daily to a population of about one-and-a-quarter million of inhabitants.

We recommend the study of the Croton Aqueduct to the members of the Royal Commission, as well as to the water companies of London and all our large cities and towns, many of which are deplorably destitute of this the first necessary of life and health. It would appear, by the niggardliness, or rather covetousness, of our water companies, that in searching for a supply of water they have learned nothing since the days of Sir Hugh Myddelton, who, when the population of London was not more than one-seventh or eighth of what it now is, conducted the New River twenty miles from its source. This still forms the best portion of the supply of water to the metropolis, and so reflects disgrace upon poor Sir Hugh's successors in the work of supplying the largest and richest city in the world with one of the first necessaries of life.

A CHEDDAR CHEESE STORE.

In the course of our search for some preliminary information regarding our English contributions to the International Exhibition of Cheese in Paris, we were induced to visit the warehouses of Messrs. William Clark and Son, of Bristol, who despatched to the exhibition a selection of Cheddar cheese. The art of making cheese is now nearer perfection than it perhaps ever has been; but the immense increase in consumption has had the same effect upon it as it has upon wines and whiskies. The demand to a great extent prevents the makers and merchants maturing it in large quantities. Hence the finest qualities are not to be met with every day, even at the high market value which they represent. There is, indeed, a prospect of better days to come. The Americans and Canadians are emulating our most successful dairymen, and really choice American and Canadian cheese may now be obtained from those English importers who have made themselves well acquainted with the best sources of supply. The principal in the firm whose stores are mentioned above, even took to America some of our English vats, and by a course of instruction induced some of the principal manafacturers to adopt our sizes and peculiarities of make, not forgetting the introduction of liquid annatto, which we are told is now in constant use there.

Messrs. Clark and Son's business originated at Cheddar, where they still have a central depôt for the collection and storage of cheese from the surrounding country. The necessities of an increasing trade, both in the home and export branches, caused them some years ago to open extensive stores in Bristol, which are essentially *Cheddar* cheese stores. Here we find represented every make coming under the denomination of "Cheddar," and, as we are upon the subject, it may, perhaps, not be amiss to enumerate them. First, then, there is the fine white, weighing from ten to one hundred pounds each; secondly, fine straw, made in same sizes as the first-named; and the large red Cheddar, which always finds a favourable market in Ireland, though only in exceptional districts suitable to the English palate. We next come to those descriptions manufactured especially for shipment to foreign countries. These, though varying somewhat in general character and flavour, are all alike in one respect; they are "closer" made than the fine cheese, and are necessarily new, as well-matured cheese will not keep well in hot climates. The favourite kind for shipment is the small loaf cheese, in sizes of from five and a-half to twelve pounds each, with a dull red and very tough skin. Then there is the double Glo'ster and Cheddar, made especially for shipment, principally to the Australian and Indian markets. There is one description of white Cheddar which has become a great favourite in Canada, and this bears the brand of the royal arms. The preference is due in a great measure to the loyalty of her Majesty's subjects there, though the quality alone—at least of that shown to us by the Messrs. Clark—is sufficient to recommend it to the fastidious palate. We wonder whether the delicate stomachs of the Fenians now confined in Kilmainham and other Irish prisons would revolt against a snack of the royal arms brand—we guess not.

The Welsh cheese-eaters are peculiar in their tastes, and "Welsh rabbits" are not things of tradition, as some people suppose. The thin single Glo'ster, either very red or very white in colour, may be considered as the Welshman's own cheese. It is good for toasting. It liquidises—if we may use the expression—evenly and readily; and "Welsh rabbits" are still the Welshman's favourite, if not his national dish.

In these remarks we have endeavoured to show the origin and destiny of some of the best known descriptions of cheese. There is an equally favourite, but quite distinct class—the Leicestershire cheeses; but of these we will take the earliest opportunity of writing from the midst of one of the extensive stores in the market town of Leicester, where more than Leicesters alone find a central market. Messrs. Clark's warehouses are of sufficient extent and importance to demand our attention, as what may be appropriately termed stores representing the Somersetshire and Gloucestershire districts. The Bristol branch is situated in Temple-street, and consists of six floors, from a hundred-and-fifty to two hundred feet in length. They are of course very much alike in appearance—all cheese stores are. One monotonous-looking row succeeds another, and the only variation of the one monotonous view repeated to the eye, no matter in what direction you turn, is an occasional truck used for the removal of the cheese, a weighing machine here and there, a few vats, shapes, or, more plainly, cases in which some of the larger cheeses arrive, and some white smock-frocked men armed with those well-known instruments used in extracting samples for tasting. Yet there is one department which gives some relief to the visitor, and this is the floor devoted exclusivele to the export trade. It is not generally known amongst our London retail tradesmen that every cheese exported to foreign countries is encased in bladders. At Messrs. Clark's warehouses a number of men are constantly employed in moistening numberless bladders, and pasting them carefully over the surface of loaf and other cheeses intended for export. In addition to the bladder, a composition is used which serves to thoroughly exclude the air. The bladders are first soaked in this composition and then rubbed over the cheese, which, when dry, are packed in small cases for shipment. Messrs. Clark and Son conduct an extensive export trade, principally with Australia, India, and China.

English cheese is becoming a great favourite in France, and this year more than ever shall we make a good show in the "*Fromages présentés par des exposants étrangers.*" Medals of gold, silver, and bronze (represnnting 1st, 2nd, and 3rd prizes) are placed at the disposition of the jury, to be distrsbuted to the best lot of cheese exhibited by strangers; and besides this a prize of honour, consisting of a large gold medal, will be awarded to the exhibitor of the best lot, without distinction of class. Messrs. Clark's contributions were sent in ten cases, and comprise single Gloucesters, double Gloucesters, finest white Cheddars, finest red Cheddars, yellow Cheddars, Royal Arms, white Cheddar loaf, shipping loaf (prepared for export) shipping doubles, cream Stiltons, and Cream Cottenhum. All the specimens are of the finest quality, and come from the best dairies. The white Cheddars are a hundred-weight each; these obtained a prize at the Evercreech Agricultural Show, held at Shepton Mallet this year, where they were placed in competition with some of the choicest descriptions made in that cheese-producing district. The white Cheddars, which are of the choicest quality that can be made, will, after the show, be sent to Windsor Castle for use at the Royal table. Messrs. Clark have for years supplied her Majesty's purveyors at Windsor.

The Scotch have been taught to make "Cheddars" by a well-known cheese-maker of Cheddar, and the manufacturer of some of the white cheese of that name which Messrs. Clark have sent to Paris, and who, it is said, took a tour through the length and breadth of Scotland for the purpose of instructing Scotchmen in the way of making cheese. Since this they have been more successful in their cheese competitions with English makers, and have so far progressed in the art as to essay the making of "Cheddar cheese," which is said to be of good quality. Our cheese producers should, in the face of this active competition, be stimulated to more activity, and agricultural societies might profitably expend a little of their superfluous cash in prizes for cheese.

The Americans have taken a leaf out of the Swiss book by establishing public cheese factories to which the dairymen send all their milk, receiving their due proportion of cheese when the season closes. The American Dairymen's Association has just published its first annual report. The Society comprises 300 dairies, and receives the produce of 130,000 cows. Great advantages are supposed to result from mixing the various kinds of milk, though this seems hardly fair to the members, unless those who send in the richest milk get the most cheese. Even then, a Cheddar farmer would hardly like to mix his choice milk with that of some of the "lean kine" belonging to his less favoured neighbours. The great thing is, that the cheese is always well made and the expense of making is reduced to a minimum. In Switzerland, where the plan has been long in use, the cheese from the public dairies always fetches the highest price. Butter is made on the same plan, and very successfully, in New York State. "We are not so sure," says the *Mark-lane Express*, "but that it would pay our own dairymen in the cheese and butter counties to form similar establishments. . . . Even where they sold some of their milk it would be better and cheaper to have the rest manufactured in a public dairy than at home." This is what we shall probably come to at last; butter and cheese factories, "dairy mills" in fact; but where then will be the poetry of country life? The flail is almost gone, and now the churn is threatened.—*The Grocer.*

A TALK WITH PROFESSOR VOELCKER ON CHEESE-MAKING.

The following is an extract from Mr. Willard's letter to the *Utica Herald*, in which he gives an interesting account of a day spent with Professor Voelcker, chemist of the Royal Agricultural Society of England:

Dr. Voelcker is free to confess that he does not understand the nature of rennet, and he has proved that the chemists before him have been wrong in their conclusions. In looking over the result of his analysis of milk, although knowing perfectly well the per-centage of its different constituents, I was struck with the large amount of phosphates which it contains. He showed me the different solid constituents in a quart of milk. In one bottle was the oils, in another the casein, in another the phosphates, the milk sugar, &c. The amount of phosphates in a quart of milk is no infinitesimal quantity; but our farmers will better understands its bulk when I say that it is "quite a handful," and then consider for a moment the large number of these handfuls that are taken from the soil by our dairy farmers, and never returned.

The Doctor remarked, while showing me the bottle containing the phosphates, that they were really the manures upon which the finer grasses feed, and that the best results always follow their application upon old dairy farms. There is an immense waste of bones in America: here they are husbanded, imported from America and other countries, and largely used. At Utica there are tons and tons of bones annually shipped by canal East. I suppose some of them find their way here. Why will not our dairy farmers make some arrangement by which these bones may be ground up, and applied to the pastures and meadows in the immediate vicinity? I am sure no investment would pay better.

I was glad to find my views of old pastures being superior for milk to newly-cultivated grounds agree with those of Dr. Voelcker. He says the quality of milk is greatly influenced by the finer grasses, and these only are found upon the old sward. When you commence cultivating and manuring with barn-yard manures, you get an order of plants that may give quantity of milk, but of very inferior quality, and he assured me that cheese of the finest flavour could not be made upon such grasses. Nor would it possess the keeping qualities of that made upon the finer grasses grown upon an old sward.

He said to me that one of the greatest faults of cheese-makers was in the application of heat. Many used too high heat. The lower the temperature that could be used, and the more uniform or even it could be applied, the better flavour would obtain to the cheese. Another point of importance in cheese-making, and one not generally understood, was in relation to the whey. It should be drawn off, got rid of, just as soon as possible, or as soon as consistent with the necessary operations. The reason he gave was, that you could never tell what matter you had, or what you were dealing with in the whey. It may contain taints of the worst character. You cannot well determine the degree of its acidity, and hence great risks were run in steeping the curd for a long time in the fluid. He would prefer to draw the whey as early as possible from the curd, and allow the curd to undergo its proper change and arrive at maturity, heaped up in the bottom of the vat.

There is a general misapprehension among dairy-men in regard to the qualities of milk. Many suppose that because a certain specimen of milk happens not to be rich in butter, it must necessarily be very rich in casein—that is, what it loses in butter is made up in an extra amount of casein. Dr. Voelcker shows this assumption to be false. The casein, in different samples of milk, show a nearly uniform quantity, whether the milk be rich or poor; but the variation in butter is very great. How important, then, it is to have pastures that will add oil to the milk, rather than water! I said to him that I had been through Somerset, Wilts, Gloucester, and the great dairy districts in the south of England, and that I could easily comprehend why the American cheese contained more butter than the English. Your analysis of cheese shows that, and I think one reason is the faulty manner in which the English work or break the curds. I said, "The Americans have been studying for years how to retain all the butter possible in the curd; but here, in England, I see among your best cheese-makers a much greater waste of oily particles than at our best factories." He admitted the fact, and remarked that there was far less waste of butter by using a sharp-cutting instrument in the curd than by breaking, as practised by many of the best cheese-makers of Cheshire and Somerset. He had proved this by the analysis of whey; and he said when a sharp-cutting instrument had been used *carefully* and *judiciously*, but the merest trifle of oil could be extracted from the whey. I explained to him our new process of "coarse curds;" but he thought better results could be obtained in flavour, by making the curds fine.

Speaking of the whey, he remarked that he would always draw it, if possible, while it was sweet; and, at our factories, it would be profitable to extract the milk sugar by evaporation, as they do in Switzerland.

I said to him, "From your analyses of different samples of choice cheese, I notice the fine quality does not depend upon the quantity of butter it contains, since your best cheese contained a considerable less per-centage of butter than our American:" He said flavour and rich buttery appearance depended not only upon a nice manufacture, but upon uniform temperature in curing. It will not do to roast cheese one day and cool it down the next. The process of curing must be so gradual that all the constituents may mingle together, without detriment to either.

THE BEST WHEATS FOR DORSET.

At the first meeting of the Winfrith Farmers' Club for the winter months, held at Wool, there was a better attendance than usual. Mr. J. A Damen occupied the chair.

Mr. Sly, of Bindon Mills, said the subject for discourse that evening was the best sorts of wheat to be sown in this neighbourhood, which he had been kindly asked to bring forward; and he did so trusting to hear from one and all their opinions respecting the different kinds that they could grow most of, and which were best suited to the different soils in the locality. By so doing they would not only enlighten each other, but benefit all. The more wheat they could grow on a given acreage, the better it would be for themselves and the country at large, as a good crop with moderate prices was better than a poor crop with high prices. Therefore it was their interest as well as their duty to get as much as they possibly could out of the land they occupied, at the same time paying due attention to the qualities required for making good flour and bread. There were many varieties of wheat now under cultivation, and their experience had no doubt taught them which were best adapted to the land they had to deal with, whether on the hills or in the vales. As a miller he might say the best sorts of red wheat which he liked when he got them in the mill, were the old Red-straw, Nursery, and Red-neck. He had also seen and heard that on the hills these three stood best against the blight and the rough winds. There were other descriptions which grew on the plains, that would suit the miller for mixing. In kindly free soils, for instance, the Golden-drop would answer. But there were others which were preferable, such as the Red Essex, Clover's Red, Red Cluster, Marigold, and many others. With regard to white wheats, they are grown best on very free sandy and loamy working land, perhaps after two years' turniping, &c. But if they are not saved well from the wet, they are not so good for the miller as red wheat. But he must leave to their own judgment to decide the best sorts which were adapted to the particular land they occupied. This, however, was not all that they had to do in order to secure a good and valuable crop, which depended very materially on the treatment of the soil a year or two previously. The land that he occupied was of different descriptions—some stiff with clay subsoil, some light with gravel beneath, and some boggy, with peat and springs. In this latter the water is quite clear when it comes up, but after being exposed to the air, a red pulpy matter forms by the sides and at the bottom of the ditches, and if the settlement is allowed to remain undisturbed it becomes crystallized to the thickness of a penny-piece. Where it has been gradually running on the top of the soil for several years it leaves just under the surface a layer of hard red sandy stone, impregnated with iron, and the longer it remains the harder it gets. He had drained nearly all this boggy land; but the pipes were being continually stopped up by the sediment, which in time became as hard as the pipes themselves. On these parts of his farm he had been obliged to apply chalk, clay, and road scrapings, with a good dressing of manure to get it to bear a good crop of anything. If kept dry it would grow mangel and oats in succession; but if he allowed the drains to become choked, where the water broke up and spread over the land, it killed all vegetation. On his stiff land with clay subsoil he grew the best wheat after beans, or a good broad clover plant, both being well dressed with farmyard manure. His lighter soil would grow excellent wheat after a good clover plant, with the same sort of dressing, or after a good turnip crop, which has been drilled in with a liberal dressing of guano, pig dung, and ashes, and fed off with sheep, or with the turnips ploughed in, by chopping them well and squeezing them abroad with an iron roller before ploughing, and rolling well after the wheat is sown. He had found that of the two he got the best crop where the turnips were ploughed in. He now begged to leave the subject in the hands of the members, trusting to hear the various opinions which they had formed as the result of their experience.

Mr. White said he did not agree with Mr. Sly as to the old Red-straw. He had always been in the habit of sowing on light sandy land what they called the Pedigree, which he found to answer better than almost anything else, though he had tried different sorts of red wheat; but on the hills he preferred the Nursery. He had sown some late white wheat on light sandy soil; but he always found the Pedigree paid better, though he did not get so much for it by £1 a load.

Mr. Bates observed that in Shropshire it was always considered that there were very few soils that would carry white wheats. In Lincolnshire it was also the conclusion that red wheats, owing to the compactness of the ear, were less liable to sprout in a late harvest. In those districts red wheats were considered the best adapted to strong soils.

In the course of a little conversation which ensued, several members stated that on their land they could grow more Nursery than Pedigree, the difference being attributed to situation and soil. It was also remarked by Mr. Sly that by way of experiment he had grown in his garden no less than 95 ears from a single grain, yet he had not found thin sowing to answer in the field.

Mr. Reader said he had found from experience that the less strawy wheats produced the most corn. Wheats that grew a large quantity of straw were very deceptive to the eye; but when thrashed they found the mistake. He had done with the Pedigree, Kessington, and all red-straw wheats. He gave one or two instances in support of this position, and observed that on the hills they could grow more Nursery than the others he had tried. It stood well, and they could get a good sale for it. The Conservative required pretty good land; but he did not think it equal to the Nursery, though with good soil they could grow a tolerably good crop of it. In reply to Mr. White, as to the quantity of seed that should be sown per acre, Mr. Reader observed that the earlier they sowed the less seed was required. With respect to a change of seed, he preferred getting it from a warm climate to a colder. He did not mean to say that on some kinds of land they might not get a change from a hilly bleak climate with advantage; but, generally speaking, if they obtained their seed from an early district, the crop would come to harvest several days earlier than that obtained from a late district; and a few days at that period was of the greatest importance. On his hilly land he had found thin sowing to be a failure.

The Chairman said it was not likely they would all be unanimous on this subject, because soils and seasons made a great deal of difference. He agreed with Mr. White, and found he could grow more of the Kessington or Pedigree wheat than any other, and he was also favourable to Foster's One-year. He liked to see a good quantity of straw, for without straw they could not have much wheat.

Mr. Reader said he liked to see plenty of straw, but not from a wheat that was inclined to run to straw.

After a little further discussion, a vote of thanks was proposed to Mr. Sly, and that gentlemen having expressed his acknowledgments, the proceedings terminated.

LIME AS A MANURE.—Nearly every plant and vegetable has a portion of lime in its composition, and from this fact the necessity of keeping up a supply of it in the soil is apparent. A certain portion of it is necessary in every soil—more than this is useless. In some cases it has a remarkable effect; in others no good results are visible. Its effects are not immediate, but are lasting, especially on land laid down for permanent pasture. It promotes the growth of clover, and grasses of every kind, and adds to the size and vigour of root crops. A small quantity of lime mixed with muck or rich soil of any kind will have a better effect than a much larger quantity applied without the addition of any other substance. Professor Johnston says, "Lime acts in two ways upon the soil. It produces a mechanical alteration which is simple, and easily understood; but it is the cause of chemical changes which are really obscure, and are as yet susceptible of only partial explanation. First, it supplies a kind of inorganic food, which appears to be necessary for the healthy growth of all our cultivated plants. Secondly, it neutralizes acid substances which are naturally formed in the soil, and decomposes, or renders harmless, other noxious compound, which are not unfrequently within the reach of the roots of plants. Thirdly, it changes the inert vegetable matter in the soil, so as gradually to render it useful to vegetation. Fourthly, it facilitates or enables other useful compounds, both organic and inorganic, to be produced in the soil, or so promotes the decomposition of existing compounds as to prepare them more speedily for entering into the circulation of plants." Lime exists in clover and wheat, turnips, oats and maize, and in almost every plant. In nature it mostly exists as a carbonate, that is in conjunction with carbonic acid. Sinclair says that the saving of labour alone would be sufficient to induce a farmer to lime his land, were there no greater benefit derived from the application than the opportunity thereby gained of working it more easily and in a more perfect manner.

THE LIVERPOOL WOOL TRADE.

ANNUAL REPORT.

The year just closed will ever be a memorable one to the mercantile community of this country. The great depreciation in the value of cotton as well as in ships, financial disasters at home, and political disturbances on the Continent, attended by war, money for the greater part of the year at extremely high rates (the minimum Bank rate of discount at 10 per cent. from May till August), the prevalence of cholera and cattle disease here and elsewhere, and, lastly, a deficient harvest at home and abroad (Southern Russia and California excepted); all these constitute a combination of disastrous circumstances which could not fail to have a very depressing influence upon most branches of trade. It need, therefore, excite no wonder that our report on the wool trade for the last twelve months does not share the favourable character of former years; still there is some cause for congratulation in the fact that this important branch has certainly suffered in a less degree than many others—the home demand for woollen goods having been very fair, "short time" resorted to only in exceptional cases, and very few failures having been recorded —proving thus the thorough soundness and stability of the trade.

The raw material has, with scarcely any exception, more or less declined in value, so that prices now rule lower than they did twelve months ago; but it must be remembered that their range had then reached an unprecedentedly high point. Both consumers and dealers have also this year been actuated by great caution, and have seldom purchased more than was required for the supply of actual wants.

The imports of wool show again a considerable increase, as it appears, from the Board of Trade returns, that during the eleven months ending 30th November, we have received from Australia about 3½ million, from India 8½ million, and from other quarters 13 million lbs. more, but from the Cape 2½ million lbs. less than during the same period of 1865.

In the exports there is a material falling off both as regards colonial and foreign wools, Belgium alone having taken 8 million lbs. less (owing, no doubt, to the greatly increased direct imports from Buenos Ayres), France 3½ million lbs., and the United States and other countries about 6 million lbs. less this year than during the previous one; but with respect to home-grown wools the contrary has been the case, the exports to France having been considerably in excess of former years.

With regard to woollen manufactures there is but a slight increase in the value of the exports; the amounts, according to the official returns for the eleven months of this year, being £24,106,367, against £22,980,992 in 1865—the diminution in those to Germany, accounted for by the late war, having been made up by a corresponding increase in those to the United States. From the subjoined particulars of the returns referred to, it would appear that the quantity of wool for home consumption this year exceeds that of the preceding one by about 40 million lbs., but as the quantity in 1865 was about 26 million lbs. less than 1864, the difference is not so striking as it at first sight may appear, and although stocks are larger than last year at this period, they are by no means excessive.

Australian Wools have arrived in increased quantity, and been brought forward at the quarterly public sales in London as follows: From the 1st to the 26th March 85,327 bales, including 20,469 bales Cape; from the 10th May to the 23rd June, 157,613 bales, including 15,569 bales Cape; from the 16th August to 25th September, 138,068 bales, including 19,501 bales Cape; from the 15th November to 10th December, 77,272 bales, including 43,949 bales Cape.—In all 458,280 bales, including 99,488 bales Cape. About 150,000 bales of which have been taken for exportation, principally to France and Belgium. In March, when stocks were low and manufacturers fully employed, prices advanced about 1½d. to 2d. per lb. on the previous December rates, but at the May-June sales when the financial crisis and the war on the Continent had made themselves felt throughout the whole trading community, they suffered a decline of about 2½d. to 3d. per lb. This, however, in the following series was recovered to the extent of about 1d. per lb., whilst during the November-December sales again a reduction of fully 1d. per lb. had to be submitted to. The condition of these wools has on the whole been very satisfactory, although owing to the drought that had prevailed in the colony a larger proportion than usual arrived in the grease. Some descriptions still continue to be infested with burrs, which of course is very prejudicial to their sale.

Cape.—The fluctuation in prices of Australian has been fully shared by Cape wools during the three first series of sales, but at the last the decline was even more decided, averaging about 2d. per lb., in consequence of the unusually large quantity offered on that occasion, forming more than half of the total number of bales. We are glad to report a marked improvement both in the condition and the getting-up of these wools, and as they have realised better prices in proportion, growers will have deservedly reaped the benefit of the care and pains bestowed upon the management of their flocks.

Spanish and Portugal.—The arrivals of the former have been very trifling, consisting principally of black wools in the grease, for which the demand has not been very brisk. Spanish Frontier wools have met with ready sale, and pretty nearly maintained the same range of prices throughout the whole year. Oporto fleece has been affected in some degree by English wools, for which it serves in many instances as a substitute, and although its vnlue has not undergone the same reduction, prices must be quoted fully 1d. per lb. lower than at this time twelvemonth; the lower grades, however have suffered rather more, and the difference in price of Lambs' and Cotts' is about 1½d. per lb. between now and the end of last year.

River Plate Wool imports show a fair increase over last year, but although the prices obtained here for fine washed and greasy Merino and Mestizo wools have this season compared very favourably with those at Antwerp and Havre, the bulk of this class is still exported to the Continent, the receipts at Antwerp alone being equal to half of the total exports from Buenos Ayres. In the spring fine washed Buenos Ayres and Monte Video realised good prices; but they declined in value in sympathy with fine Colonial, and are now 1d. to 2d. lower. Stocks of this class are, however, very light, and the first arrivals of the new clip will no doubt command a ready sale at full rates. In Cordova, Santiago, San Luis, and Santa Fé we have had a steady business throughout the year at prices which have naturally been more or less influenced by English wools, and, like them, have suffered a decline in value of from 10 to 20 per cent., the decline being greatest in the inferior, ill-conditioned parcels, of which a considerable quantity has been taken for export to the United States during the last two months, leaving but a moderate stock of all descriptions.

Alpaca and Peruvian exhibit both increased imports. Alpaca has been in excellent request throughout the year, almost invariably bought for future arrival, and with the exception of a few sales in July and August, at 3s. to 3s. 2d. for prime quality, prices have been well supported, being now much the same as at this time last year. Peruvian washed wools have been in very languid request, both for export as well as for home consumption, throughout the year, and although prices have receded fully 2d. to 3d. per lb. stocks are now considerable. Lima and Chili greasy wools have arrived in moderate quantities, and being now in better request for the home trade, in consequence of their freedom from burr, have generally met with ready sale on arrival, at prices which, although they have fluctuated more or less, are now almost on a par with those of last December.

East India and Persian continue to be sent almost exclusively to this port. The arrivals have been much larger than in former years, and so has been the aggregate number of bales brought forward of this class at our quarterly public sales which took place here: From 25th January to 1st February, with 15,370 bales; from 3rd May to 9th May, with 12,695 bales; from 31st July to 11th August, with 23,747 bales; from 23rd October to 3rd November, with 27,602 bales—in all, 79,414 bales; against 61,430 bales in 1865, 69,458 bales in 1864, 60,835 bales in 1863, 56,035 bales in 1862, 63,677 bales in 1861, and 56,534 bales in 1860. The proportion of clean, well-conditioned wools has this year been unusually small, the great bulk consisting of inferior, wasty, ill-conditioned, and half-washed shipments; and this preponderance has greatly contributed to the depression in their value; for whilst really good East India have suffered comparatively little, the reduction on other classes is very considerable, and may be quoted at about 30 per cent. to 50 per cent. below their range at the end of last year. The supply of true-bred Persian has been much less than in former years; that of bastard Persian, on the other hand, considerably more; the latter, also, for the most part of inferior quality and condition, have sold irregularly, and undergone a very material decline, quite equal to that in low East India. Good Persians must be quoted lower, too, than this day twelvemonth.

Russia.—Donskoi wools have chiefly been sent to London this year, and stocks there have been very considerable, whilst the demand has been but languid. The home trade have not taken their usual share, but a good portion has latterly been purchased for exportation, partly to America. Prices have participated in the general decline.

Egyptian and other Mediterranean Wools have not engaged much attention, excepting parcels of prime quality and condition, prices of which have hardly changed; but the lower and badly-conditioned classes of Egyptian, Turkey, Georgian, Smyrna, Syrian, &c., are worth less than at this time last year.

Barbary.—The imports show some increase, if compared with the previous twelvemonth. The first arrivals of good wools were readily competed for at very fair rates, but latterly the demand has been languid, and sales have only been effected at reduced and irregular prices.

Iceland has arrived at this port in increased quantity, but for the whole kingdom the imports have somewhat fallen off. Early in the year, when English wools were still high in price, some manufacturers contracted for good North wool, to arrive. However, by the time the bulk of this class had come in, Domestic wools had suffered a material reduction, but importers being loth to make a proportionate concession, sales have been of but limited extent, leaving a considerable stock now on hand.

Mohair. — The imports have been less than in 1865. Prices have fluctuated a little with the demand for this article. They reached 3s. 10d. per lb. for the best quality in September last, but since then prices have given way a little, and although we still quote prime Mohair the same as last year, stocks having accumulated, and there being little or no inquiry at present, they must be considered nominal.

Domestic Wools.—At this time last year prices, though very high, were about 10 per cent. below the closing rates of 1864. For the first five or six months of the present year, however, with but little variation, they gradually receded, as the demand had all along been very sluggish, and at the opening of the new clip, prices were found to be from 30 to 35 per cent. below the closing rates of last year. In the beginning of August, and in consequence of the close of the war on the Continent, a speculative feeling became manifest, causing an advance of 10 to 15 per cent., which, however, was of but short duration, and prices now close at about 20 to 25 per cent. under the rates current this time last year, but, we are glad to observe, with a rather better demand for the last fortnight or so. Scotch: We have to confirm the remarks made in our last annual resport respecting this article, and as comparatively little of this wool comes now to this market, prices are to a certain extent regulated by the rates current elsewhere.

Sheepskins.—There has been an increase in the imports; rates have considerably fluctuated, having been highest in March and April, since which period they have gradually declined; the better classes, however, have given way comparatively little, whilst inferior and faulty descriptions have undergone a proportionately greater reduction.

Liverpool, *Dec.* 31, 1866. R. W. Ronald & Son.

LINSEED, LINSEED CAKE, AND OIL TRADES.

ANNUAL REPORT.

We are glad again to have a pleasing retrospect to call your attention to, in reviewing the business of the past year: 1866, like its forerunner 1865, having being a profitable one to nearly all those concerned in our trade, and that too in the face of the (taking its extent and duration into account) most disastrous financial crisis which has occurred in our time. The value of linseed has ruled high in consequence of the diminished supplies, but we are glad to learn that the prospects for the future are such as to warrant the hope of a lower range of prices after the close of the current season 1866-1867.

Linseed was quoted 66s. 6d. cost, freight, and insurance for Calcutta, sound bags, when our last Annual was issued, but the market was dull for some weeks afterwards, and a fall of 2s. per qr. ensued. Scarcity of supply and an artificial demand for oil subsequently caused an advance of 6s. per qr., and 72s. was the quotation at the end of March. After which the value fell to 65s., at about which it remained during the summer, advancing to 70s. as the autumn approached, when its relative value to other description caused a decline of 2s. 6d. in November, and it has scarcely varied 1s. per qr. since, to-day's price being 67s. In the spring and summer, the larger proportion of Black Sea seed, and old prejudice in favour of Calcutta, caused a difference of 5s. to 6s. per qr. between the two descriptions; but this is now reduced to the old margin of 1s. to 2s., and in most of the speculative operations (particularly that of November), Black Sea cargoes have been the medium of purchase. The spot price of the latter quality early in the year varied from 65s. to 73s., and then down to under 60s. in June, afterwards advancing quietly but steadily to 67s. last month, with a considerable trade done in cargoes then shipping, up to 68s. per qr., and the cargoes off the coast are to-day held for 67s. The difference between the relative value of spot and forward seed is much diminished, and the prices now assimilate more than formerly, owing to the facilities given by steam navigation, and which are daily on the increase.

Monthly range of prices of Calcutta Seed on "Association Terms," cost, freight, insurance, and sound bags: 1866, January, 66s. to 64s. 6d.; February, 65s. 6d. to 70s.; March, 71s. to 72s.; April, 72s. to 68s.; May, 69s. to 65s.; June, 66s.; July, 65s. to 66s. 6d.; August, 66s. 6d. to 70s.; September, 70s.; October, 70s. to 68s.; November, 67s. 6d. to 68s.; December, 69s. to 67s.

The quality has been fair, as regards admixture, but there has been an unusual amount of country damaged grains in Black Sea parcels, and generally an allowance granted on this head. Other sorts have been of about average quality. For next season we shall probably have a supply equal to any previous year, and the qualities are all well spoken of; no transactions are reported for future shipment, the present high cost at shipping ports rendering sellers indifferent as to entering into contracts. The stock in public warehouse here and on board lately arrived ships is 25,000 qrs. At Liverpool there is none, at Hull 95,000 qrs. in addition to crusher's stocks, which are roughly estimated at 25,000 qrs. Afloat we have a fair quantity, say about 245,000 qrs., consisting of 110,000 qrs. East Indies, 110,000 qrs. Black Sea, and about 25,000 qrs. Mediterranean, Baltic, &c. London has only imported 258,000 qrs., consisting of 170,000 qrs. from East Indies, 69,000 qrs. from the Black Sea, 12,600 qrs. from the Baltic, and remainder from Mediterranean and sundry other ports. The re-export is the smallest on record, amounting to less than 20,000 qrs., or about *one-eighth* the quantity re-shipped in the previous year. The aggregate imports into the United Kingdom is made up of about 195,000 qrs. from Calcutta, 50,000 Bombay, 325,000 Petersburgh, 22,000 Archangel, 66,000 Riga (including 31,000 qrs. sowing seed), 50,000 Memel, Konigsberg, Dantzic, Pillau, and other Lower Baltic ports, 292,000 Black Sea, and remainder Mediterranean and sundries. The Black Sea cargoes coming to direct ports, and calling at Falmouth for orders, consisted of about 310,000 qrs., which were discharged as follows: Hull 116,200 qrs., London 71,200, Grimsby 30,450, Gloucester 16,800, Boston 12,050, Liverpool 10,700, Ipswich 10,050, Bristol 5,300, Rochester 4,300, Dover 2,450, Lowestoft 2,300, Leith 2,200, Newcastle 2,100, Southampton 1,950, Glasgow 1,800, Portsmouth 1,700, Newhaven 1,400; 17,100 qrs. went to Holland, and in addition to which about 50,000 qrs. went from Black Sea ports direct to Antwerp. The direct exports from the north of Russia have included 50,000 qrs. from Petersburg, 42,000 Archangel, 40,000 Riga, and about 45,000 Memel, Konigsberg, &c., also some 60,000 qrs. of sowing seed from Riga.

Linseed Oil continues the favourite article for speculation in the particular branch of trade which this circular treats of, and 1866 has been no exception to its predecessors. The early months of the year having been characterised by one of the largest (and probably least successful) operations yet entered into. £38 was the opening price, but the make being in excess of demand, a fall of £2 occurred during January. Large forward contracts about that time came in course of fulfilment, and the buyers received and stored the oil; thus sustaining and advancing prices, which, had they been regulated by the ordinary question of supply and demand, must, in the absence of the usual export, have fallen considerably. As it happened, the opposite was the case, and the value went steadily to £41 in March. In April markets were very dull, and although a momentary check was given to the decline early in May, in consequence of an exceptional inquiry for the United States, before the month closed the speculative holders had taken fright, and the value receded to £33 10s. At this time the heavy stocks previously held had (assisted by the small make then going on) become absorbed, and the tone of the trade was restored to much more healthy condition. During June and July £36 was the value, and the following two months a steady-American demand coming on, a bare market sufficed to increase the value to £42, after which the supply mended, and, in the absence of either American or Continental orders of any consequence, it gradually declined to under £36, but during the past month it has recovered to £37 10s., which is to-day's value. We annex our customary statement of monthly

Prices of Linseed Oil.—1866: January, £38 to £36 5s.; February, £37 5s. to £38 10s.; March, £59 10s. to £41; April, £40 10s. to £37 10s.; May, £38 5s. to £34; June, £36 to £36 10s.; July, £35 10s. to £36 10s.; August, £37 10s. to £40 10s.; September, £42 to £42 10s.; October, £40 to £38 10s.; November, £38 to £37 10s.; December, £36 5s. to £37 10s.

The exportation during the past year will be found short as compared with 1865. America has, however, taken 8,500 tons, which has in some measure compensated for the exceptionally very small quantity shipped to the continent. It amounts to about 25,000 tons in 1866, against 37,000 tons in 1865.

Linseed Cakes.—Home-made as heretofore have been in very large consumption. Prices from January to early November scarcely varied 10s. per ton. Cakes having been in steady demand at £10 15s. to £11 10s. according to quality during that period; since then the exceedingly high rates paying for all other kinds of feeding stuffs have improved the value for best quality, to £12 per ton, which is the current rate to-day. Of foreign the supplies will be found to be 20,000 tons in excess of 1865, amounting to 120,000 tons, of all kinds, into the United Kingdom. As in the case of home-made Cakes, there was but little fluctuation in prices until towards the close of the year, when from same causes they participated in the rise common to all feeding stuffs. The value of best New York bags in January was £10 10s., and barrels £10 15s. to £11, and same prices continued with very little variation until November, when £11 to £11 5s. was paid for bags, £11 10s. to £11 15s. for barrels, and last month bags sold at £11 15s. and barrels at £12, which are to-day's quotations also.

Rapeseed has been in very large supply from the East Indies, and this, together with an abundant crop on the Continent, has caused a continual fall month by month throughout the year. Spot Calcutta in January last opened at 69s. to 70s., and by end of December had dropped fully 18s. per qr., the present value being 51s. to 52s., Bombay Guzerat 59s., Poppy 61s., Niger 56s., Gingelly 78s. to 80s.

Rape Oil from same causes as Rapeseed gradually declined throughout the year. Foreign refined being quoted early in January £57 10s., and brown £54, and they fell by end of December £14 per ton—say £43 10s. to £44 for refined, and £39 10s. to £40 10s. brown.

Rape Cakes have sold steadily throughout the year, the large make helping the value down 10s. per ton in the summer months. The value in January last was £5, in July £4 to £4 10s., and it has continued at about same rates till now.

Cotton Seed.—The import the past year has been less than that of 1865 by about 20,000 tons. The market opened in January with a steady trade at £8 5s. to £8 10s. for seed of the old crop, and £8 15s. for coast cargoes of the new. The price, however, declined at close of the month 5s. to 10s. per ton, and in February it further receded to £7 5s. for old and £8 for new seed. During March an improved inquiry advanced prices, and as high as £8 12s. 6d. was paid for arrived cargoes, and also for several floating. In April the market again ruled dull with a fall of 10s. per ton in value, and we further declined in May to £7 5s. and £7 10s. at which buyers supplied themselves freely. During June, July, and August we had a steady demand at same figures; in September seed becoming scarce, prices advanced, say from £8 up to £8 10s., and value was the same in October and November, but last month a good inquiry for cakes and very small stocks of seed, drove up prices to £9 10s. for old, and £10 for arrived cargoes of the new crop. The supply of 1867 promises to be very large and considerably in excess of any previous year's imports.

Cotton Oil marked £36 10s. early in January, but for some months afterwards was very dull, and sales made at falling rates, until £27 was touched in July; since then it gradually improved to £33 10s. in September, but is quoted about £2 per ton lower to-day.

Cotton Cakes continue in great favour, and have been consumed extensively. The course of prices varied very little the first six months of last year, say £5 5s. in January, £5 February and March; £5 to £4 15s. from that time to the end of June. In July and August, as low as £4 10s. was accepted; since then the value had advanced month by month, say £5 in September and October; £5 10s. to £5 15s. in November, and £6 to £6 to £6 10s. in December.

Tallow was very steady early in the year, fluctuating between 48s. and 50s. up to end of April; it then gradually declined week by week to 44s. in May, and under great pressure of sales to 40s. for a day or two. An immediate rally to 43s. followed, and the market has again been steady, since from 44s. to 46s., 45s. being about the value of new P.Y.C. to-day.

London, Jan. 1, 1867. Eewards, Eastty, & Co.

BOILED PEAS FOR MILCH COWS AND HOGS.—"Boiled peas," says a writer in the Virginian *Richmond Farmer* "as food for milch cows, and for fattening hogs, is far superior to corn-meal, or anything else I have ever seen tried. My honest opinion is, that two bushels of peas are superior to, or worth more to fatten hogs, or to increase the milk of cows, than three bushels of corn applied to the same objects. In experimenting, I have found that hogs not only fattened doubly as fast, but that the improvement of their general condition was in like proportion." "With respect to cows," he says, "the effect was, in ten days, to double the yield of milk. My plan in using them was to soak them in water twelve hours or through the night, before boiling them. By this process their bulk was doubled, and consequently they required less boiling. Besides this advantage, I found the soaked pea an excellent substitute for green food, having not only the effect on stock produced by turnips, carrots and beets, in improving their appetite, general appearance and milking properties, but imparts none of the bad taste to the milk, which is often derived from the use of the green crops above referred to." It was, moreover, found to exhibit fattening qualities almost equal to those of the *boiled* pea. He concludes by saying: "I regard the soaked pea for food in winter as decidedly superior to all root crops," and recommends that his "brother farmers should lose no time in testing its value in their own practice."

MANURE MAKERS' MATERIALS.

ANNUAL REPORT.

Manure makers have had opportunities of purchasing well during 1866, as almost all the materials used by them have been lower than for years past, owing principally to the caution exercised in making purchases, which may be accounted for by the inability of farmers to pay as formerly, owing to the bad harvest and the cattle plague, and consequently the reluctance on the part of makers to enter into engagements which would, perhaps, necessitate their holding a large stock over until next year, from want of demand. A large number of manufacturers have still to buy, and we therefore think present prices, especially for Bones and Ash, are lower than what they will be a month hence.

Bones.—The past spring there was only a moderate demand, and prices were therefore more regular than of late years, when towards the end of the season we have always seen a sudden and material advance, owing to buyers at a distance coming in against the grinders in the neighbourhood. The fearful ravages of the cattle plague had, however, this year the effect of reducing considerably the requirements of our local buyers, and there was therefore enough for all. In May, after the spring demand had ceased, prices fell 20s. per ton, and in August buyers were so unwilling to purchase that a good quantity of common and steamed legs was sold at £4 7s. 6d. per ton, the lowest price at which sales have been made for years. During the three months prior to December there was no great change, prices ruling 5s. to 7s. 6d. per ton above the lowest point. Within the past ten days, however, we may quote an advance from the lowest point of 20s. to 25s. per ton, with every likelihood of a still greater improvement, and still we are 10s. to 15s. per ton below the current price of this time last year. The year's imports are about 7,400 tons, being as near as possible the quantity imported in 1865, and the stock is only about 200 tons now on board the import ship.

Bone Ash, when we made our last annual issue, was selling at £5 on 70 per cent.; during January it fell to £4 15s., owing to the demand being only moderate, and the desire of sellers to quit as much as possible from ship's side; from that time up to June there was no great change, and prices ruled at £4 12s. 6d. to £4 15s.; during June £4 10s. was accepted; and in July £4 5s. bought a large parcel; and since then several cargoes, arriving on ship's account (owing to the difficulty experienced in obtaining freights in the River Plate), some purchases have been made at £4 per ton. To-day's quotations are merely nominal, as no sales of any moment have been made during the last fortnight. Some east coast buyers have this year bought largely here, on account of the great difficulty experienced in getting cargoes with only a small proportion of Bones. The year's imports are about 5,600 tons against 5,500 in 1865, and our stock about 1,000 tons. The market for outports during the past year underwent quite a change to that of previous years, the demand, instead of increasing, fell off after June, and each sale reported after this month showed a decline, until prices went from £4 17s. 6d. to £5 on 70 per cent., down to £4 7s. 6d. to £4 10s. on 70 per cent. for Ash, and £6 down to £5 for Bones. There is now little or no demand, and cargoes of Ash with a few Bones may be quoted worth £4 10s. on 70 per cent., and £5, while cargoes with a large proportion of Bones are quite unsaleable. The quantity coming on is ample.

Animal Charcoal.—Almost all the spent produced here has been sold for France, at prices varying from £5 to £5 10s. as in quality. These figures cannot be got here while bone-ash is so low. Dust for ivory-black-making sells readily at £5 15s., and grey and white at £4 5s. on 70 per cent., at which it is cheap, as it tests in many instances 80 to 85 per cent.

Nitrate of Soda.—Early in the past year speculators did their best to buoy up this commodity; but, the demand not being sufficient to take off the parcels as they arrived, with some slight exceptions, prices gradually fell from 12s. 3d. down to 10s.; and since June it has fluctuated only a little, never being under 10s. or over 11s. per cwt.; and now the stock is so formidable—13,400 tons, against 8,750 tons last year, and 8,200 tons in 1864—that it is not expected any operator will be likely to try and monopolise the article. Import, 27,000 tons.

Guano.—Peruvian has not been so much called for during the past year; and the stock is very heavy. The agents here, in order to clear a large parcel of indirect, accepted a very low price; and same has been reselling by a dealer at £10 10s. to £11, as in quantity and quality. Upper Peruvian: The stock is entirely in second hands, and very small; and there is not much on the way, for which the sellers are asking £6 10s. Malden Island varies very much in quality, and there is a good quantity in second hands, for which £4 to £5 per ton is asked; and it is reported that trials made last year prove it to be equal to any phosphatic guano as a manure, when applied to the land without any preparation. Howland's Island: One cargo only has arrived here for sale, which brought £5 5s. per ton; and it tested 71 per cent. phosphates. The imports have fallen off considerably, and are only about 17,000 tons, against 44,000.

Brimstone.—Although the year's imports are nearly 5,000 tons in excess of those of 1865, the stock does not exceed 1,500 tons. Prices are now, however, 17s. 6d. to 20s. per ton lower than at this time last year. The increased consumption may be accounted for partly from the fact that raisers of pyrites are continually increasing their prices, so that many acid-manufacturers have been induced to use brimstone solely. Imports 14,465 tons, against about 10,000 tons.

Sulphate of Ammonia.—The low price of nitrate has affected this article, and caused a fall of nearly 20s. per ton since this time last year. At this decline there is not much demand, and prices will go still lower. Dark is not saleable at anything over £10 10s., and white is hard to sell, at £11 10s. per ton.

Feeding Cakes.—There was no material change in these until November, when prices advanced 20s. per ton, which advance has not, however, been maintained; but if the present hard frost continues, we are certain to see them higher. American still holds its ground in some quarters; and when the market has been bare, as in May, good cake has brought extreme prices, and equal to English. The imports the past two months have been heavy. It has not, however, given way much; and to-day £10 10s. may be considered the price for fine cake. Decorticated cotton-seed cake is again coming from the States, and sells well, at £7 15s. to £8 per ton.

Liverpool, Jan. 1, 1867. Towill Brothers.

TRADE OF THE PORT OF HULL.

REPORT FOR THE YEAR 1866.

It is matter of congratulation that during the past eventful year the commercial credit of this great port has been well maintained, and remains at the present moment in a very satisfactory condition. The failure in the metropolis of the eminent discount-house, and the collapse of so many of the limited liability companies, brought on a panic in the money market, which caused the Bank of England to raise its discount to 10 *per cent*. This serious and oppressive rate continued for the long period of *fourteen weeks*, the effect of which was, unfortunately, to give a check to the legitimate trade of the country, as well as to depress the market value of all articles of merchandise, and thereby to occasion inevitable losses to many unoffending parties. Notwithstanding this check, it is gratifying to report that the trade of the port during the year has considerably increased.

WHEAT.—The wheat trade of the past year may be characterised as a prosperous one on the whole: the fluctuations in prices after the month of April have been almost entirely in favour of the holder, and a gradual improvement since then has taken place, which may be attributed to a moderate import, a not very bountiful harvest in this country, and a decidedly inferior one in France, which latter country during the first half of the year was a very large exporter of flour and to some extent of wheat, and is now competing with us in buying for her own actual wants, not only in foreign ports but in our own markets. Although we are unable to give a return of the English wheat exported during the year, it is certain that France and even Belgium have taken a considerable quantity from our shores, and within the last few days the demand has revived and shipments are actually again taking place from this coast as well as the Baltic provinces to France. We began the year with a stock of 120,000 qrs., and close it with 60,000 qrs. in granary, our imports for the year being 235,078 qrs., against 273,787 qrs. in 1865. Dantzic again takes the lead, contributing 111,048 qrs., against 156,830 qrs. in 1865. The total imports of wheat and flour into the United Kingdom are about 6,907,300 qrs., against 6,141,358 qrs. in 1865; 7,065,145 qrs. in 1864; 6,604,142 qrs. in 1863; and 10,752,929 qrs. in 1862. From Egypt we have again had no wheat, and very little from ports east of Gibraltar has found its way to our market; while from Spain the quantity has been larger than for some years past, and as the harvest in that country has again been a favourable one, a similar quantity may be exported during the current year. The inferior crops of 1865 in the Baltic provinces and Holland have not been suitable for this market, and consequently the trade in wheat with Konigsberg and Stettin has been only to a small extent. Last year's crop promises better in every respect, and we may hope to see these ports again exporting their usual quantity. Dantzic has shipped nearly the whole of its stock of old wheat, and this year's supplies from that port must necessarily be almost restricted to the crops of 1865 and 1866. The former proved a poor one, and not much of it exists; the latter promises good quality on the whole, although some shipments already received indicate wet weather during harvesting. In January, 1866, the prices opened for English red wheat at 46s. to 48s. to 50s., for choice white Baltic 56s. to 59s., and for red 45s. to 46s. per 480lbs.; the markets remained quiet till April, when the lowest point during the year was touched, namely, 43s. to 44s. for English, 54s. to 56s. for choice white, and 44s. to 46s. for red Baltic; in May prices advanced 2s. to 3s. per qr. for English only. Foreign remaining stationary. During this month a war between Prussia, Italy, and Austria was imminent, and the rate of discount rose from 7 to 10 per cent. in three days; in June the war began, and finished the first week in July, when prices rose 9s. to 10s. per qr. on English, and only 3s. to 4s. per qr. on foreign; in July and August they receded 6s. to 7s. on English and 2s. to 3s. on foreign; showery weather towards the end of August and heavy rains early in September caused some apprehensions for the unsecured portion of the new crops, and prices again hardened, advancing 8s. per qr. upon old English, and 5s. upon foreign; new English red opening at 47s. to 50s.; in October old wheat became much sought after, and stocks diminished fast, upon which prices again rose 3s. to 4s. per qr.; in November new English was found to be only a moderate yield, and mostly damp in condition, so that prices remained nearly stationary, while old again advanced 3s., and foreign 3s. to 5s. per qr.; during the last month business was not so brisk, as the millers had bought freely beforehand, and although sales were made with difficulty, prices underwent scarcely any change, and we closed the year with a firm tone, and with new Yorkshire red at 54s. to 58s., old 61s. to 63s. per 504lbs.; choice old Baltic, 70s. to 72s., and red 60s. to 63s. per 480lbs., being an advance upon the year of 12s. to 15s. per qr. on English, 12s. to 13s. on white Baltic, and 15s. to 17s. on red Baltic. Russian sorts have been almost entirely cleared out: prices opened in January at 44s. to 45s. for fine, and closed in December at 58s. to 60s. per 480lbs., with scarcely any offering. The official averages for the price of English wheat for 1866 was 49s. 10d.; 1865, 41s. 10d.; 1864, 40s. 2d.; 1863, 44s. 9d.; 1862, 55s. 5d. per qr.

BARLEY.—With liberal importations from abroad, and a considerable advance in prices in the preceding year, we were not prepared to report this year nearly twice as large arrivals, and a further important advance in prices both principally occurring during the last three or four months of the year; but such is the fact, and this is owing to the miserable yield, especially as regards the quality of the English crops, particularly in the large agricultural counties of Yorkshire and Lincolnshire; and to a much larger extent than last year are our maltsters dependent upon foreign supplies; but happily, other countries have been favoured with a better harvest. Our closing prices for malting are 5s. to 10s., and for grinding 2s. to 3s. per qr. above those current at the end of last year, viz.; fine English malting 44s. to 52s., Danish two-rowed 42s. to 43s., and stout grinding 35s. to 36s. per 448lbs. The stock is larger than usual, but a good portion of it belongs to a few of our largest maltsters, who are holding it for their winter use.

OATS.—Our import of this grain has also been about double that of last year, but prices have undergone but little fluctuation, and are now about the same as at the commencement of the year, being to-day for good new English 25s. to 27s. for 336lbs. The stocks are somewhat larger, consisting of Russian and Swedish; but a large deficiency also of the English crop of this cereal has to be made good by foreign grain.

PEAS.—We have had a poor yield of our own crop, and the importations from abroad have been comparatively large in consequence. Prices have gradually advanced, and are now 2s. above the average of last year's closing rates, being at present 41s. to 42s. for 504lbs. for good white feeders. Stocks about on a par with last year's.

BEANS.—The crop has turned out rather better than at one time apprehended, and prices, which in October and November had taken a start of 4s. to 5s. per qr., have again receded, and are now only 1s. per qr. higher than a twelvemonth ago, being 44s. to 46s. per 504lbs. for good Hamburg and West Coast middles. Stocks have rather accumulated.

AGRICULTURAL SEEDS.—This trade has been characterised the past year by more than ordinary fluctuations.

RED CLOVERS.—As the season advanced it became apparent that the demand for this seed was unusually limited, and, as some had predicted in many districts, the fearful ravages of the cattle disease caused much less seed to be required than would otherwise have been the case; and thus prices gradually declined all through the season, and at its close were something like £20 per ton lower than at the commencement. The new crops this year (with the exception of the south of France, where a fair quantity of fine seed has been secured), in consequence of the cold, wet, and ungenial summer, are very unfavourably reported of. The English crop, we are informed, in many districts will not yield sufficient seed to pay the expenses of thrashing, and what little has been grown will be very brown and inferior in quality; the same remarks apply to the principal seed-growing districts on the continent, and thus prices have very considerably rallied, and are in fact higher than at any time during last season. White cloverseed and alsyke being confined to much more limited districts than red, and the weather being particularly unfavourable prior to and at the time of harvesting, are reported to be very deficient, amounting in some districts to almost a total failure; and this is confirmed by the fact that up to this time very few new samples have appeared, although any fine old samples remaining over from last season have lately been readily saleable at an advance of from £30 to £35 per ton.

TREFOIL.—This seed being matured much earlier than clovers, and the weather in England at the time it was harvested having been more propitious, a good average crop has been secured, and mostly of fine quality. On the continent it has been quite the reverse, the samples which have reached us presenting a very brown and weathered appearance, and the yield is unfavourably spoken of; consequently the prices of fine English seed, which were very low on the first appearance of the new samples, have advanced up to the present time 5s. to 6s. per cwt.

LINSEED.—We have again to report an increasing business in this important branch of the trade of the port. The import into Hull in 1865 exceeded that into any other port in the kingdom, and this year has gone beyond its predecessors; a fact the more striking because the import into London and Liverpool shows a very large deficiency as compared with 1865.

We have received from direct ports	552,832 Qrs.
From London and Liverpool	30,000 „
Stock last December	110,000 „
Making our supply for 1866	692,832 „
Our present stock we estimate at	120,000 „
Actual consumption 1866	572,832 „
Against do. in 1865	615,219 „
Being a decrease in consumption of	42,387 „

Import into Grimsby 44,384 qrs., against 42,522 qrs. 1865.

The Baltic has again been the chief source of our supplies. From St. Petersburg we have received 290,745 qrs., the total export from thence being 378,009 qrs. This large quantity of seed has enabled us to supply to some extent the wants of crushers, who have hitherto bought in the London market. We commenced the year with a large stock in merchants' and crushers' hands, but with small supplies afloat, the quotation being 67s. Black Sea, 65s. fine Petersburg. Prices in January were scarcely maintained, there being few buyers in the market, and arrivals pretty liberal. The first week in February brought more inquiry with hardening prices, and the deficient quantity afloat having its prospective influence upon prices, an advance in values was established, which continued without interruption until the end of March, when Black Sea was worth 72s., and fine Petersburg 70s. In April the financial disturbances, coupled with the continental war, began to affect our values in common with all other articles of merchandise; and "casting their shadows before," produced an uncertainty of feeling, terminating in a wise determination in all quarters to contract within the narrowest limits possible all business engagements. Prices gave way, and continued their downward course with one or two slight reactions of 6d. to 1s. per qr. until the middle of October, grounding at 61s. for Black Sea, and 58s. to 59s. finest Petersburg. An improvement set in, the last week of October, gradually enhancing values to the close of the year, our quotations being, as in January last, fine Petersburg 65s., and Black Sea 67s. L.A.T. The stock in all hands is about 120,000 qrs. against 110,000 qrs. last year. Prices are well maintained, the quantity afloat being 150,000 qrs. short of last year, and the stock in London and Liverpool being unusually small. No contract business for next season has yet been concluded. The knowledge of large supplies in the North of Russia, and the expectation of a similar abundance in India, deter the consumers and merchants from granting the rates now asked abroad. The quality of next year's supply will be good, and we look forward to an extensive and remunerative trade.

LINSEED OIL.—From the causes alluded to in our remarks on linseed, the price of linseed oil during the year has varied very considerably, and the natural variation has also been much increased by the speculative element, which is connected with the trade, and which unfortunately is increasing. The value of linseed oil ranged as follows, viz.: January 36s. to 39s., February 37s. to 40s. 6d., March 36s. 6d. to 42s.—the highest point reached. A gradual decline took place during the next three months, and in June and July quotations were at their lowest, viz., 33s. 6d. to 36s. 6d. per cwt. With August an improvement took place, and in September the highest value was 41s. 9d., again declining to 37s. per cwt., at which the year closed. Quantity exported 9,328 tons being 9,644 less than in 1865; to London 6,240 tons were forwarded, and New York took from us about 8,000 tons.

LINSEED CAKES.—During the past year there have only been the usual fluctuations in the value of this article. The average price has been a high one, caused by the supply of linseed not being adequate to the increasing estimation in which linseed cakes are held by agriculturists. The value of pure cake ranged as under: January £10 15s. to £11 5s. per ton, in February and March £10 12s. 6d. to £11 2s. 6d.; from April to August an advance of 5s. took place; in September £10 to £10 17s. 6d. was the rate; October £9 12s. 6d. to £10 17s. 6d.; and the year closed £11 17s. 6d. to £12 2s. 6d. per ton.

RAPESEED, RUBSEN, AND THEIR PRODUCTS.—The import in 1866 was 123,254 qrs., against 45,859 in '65, and 74,330 in '64. The excess of the year's import over that of others has arisen entirely from excellent crops in Germany and Denmark, which as to quality and condition have seldom been excelled. The price at the commencement of the year was nominally 80s. per qr. for German seed, and Black Sea 43s., Calcutta 70s., at which rates one or two cargoes were bought off the coast in January. Further Black Sea arrivals reduced the price to 60s. and 38s. per qr., at which rates they continued till the end of April, when offers of German rubsen were made at 51s. 6d. and 52s. at the port of shipment. With further arrivals from the Black Sea and the Baltic the market was over-supplied, and crushers generally held aloof, looking for lower rates. The lowest transactions were reached in June, when German seed was offered at 47s. 6d. free on board, and Black Sea on the spot 29s. per qr. This led to business, and the new crop being of good quality considerable transactions ensued. Prices advanced during August 10s. per qr., but receded again a little; again advancing towards the end of the year, which closes with steady prices—viz.: Rubsen 60s. to 62s. delivered, and Black Sea to 34s. on the spot and to arrive. The stock in warehouse is larger than usual, being 35,000 qrs. Oil: The year opened with brown at 56s., and pale 58s., which receded to 52s. and 54s. respectively on the appearance of foreign oil in the market. These prices remained with little variation up to April, when they dropped to 44s. and 45s. for foreign brown, and 48s. pale, with a slow trade. A further reduction to 40s. and 43s. took place in June, at about which rates some considerable transactions took place. Prices fell a little towards the end of the year, which closes however with more firmness and a better demand at 40s. to 42s. per cwt. Cakes: During last winter good green cake was very scarce, and held at high prices, say £6 per ton, whilst cake from East India and Black Sea seed was more plentiful, and sold at at about £4 10s. This was the only article of the kind on the market during the spring months, and in April brought £5 per per ton. After the new rape crop made its appearance the market was well stocked with both green and brown, and prices gave way considerably—£4 10s. and £5 being paid for best green, and £4 and £4 5s. for brown. A better demand existed during autumn, and prices rallied, but again fell in October, when considerable transactions took place at £4 12s. 6d. and £4 15s. for green cake. The value at the end of the year was £5 15s. for green, and £4 10s. for brown.

COTTON SEED.—The trade in this article has not been equal in extent to that of last year, the import being 21,380 tons, against 42,034 tons in 1865. These figures confirm the statements made in the early part of the year of the deficiency of the Egyptian cotton crop of 1865, as very little cotton seed is imported from any other country. Some small parcels of Brazilian and Algerian seed have been crushed here; but the results have not been satisfactory to the crusher. A few tons of decorticated cotton seed from the Southern States of

America have also been tried; but the difficulty of refining the oil, and the high price at which the cake must necessarily be sold, have hitherto prevented the extension of this trade. These difficulties will doubtless be overcome ere long, and cotton seed (like linseed) will be sent to this country from whatever part of the world it may be produced, more particularly as the price obtained for it at the place of production is so much clear gain to the grower, cost of freight and difficulty of transit being the only barriers to an immense importation. The year opened with a very small stock of old seed, which realized £8 15s. Prices fell during the month of January to £8; but the first cargo of new seed arriving in the end of the month was readily placed at £8 15s. During the month of February further arrivals of both old and new seed brought the prices down to £7 and £8 respectively. March was marked by more disposition to purchase, and, in consequence, an advance of 10s. to 12s. 6d. per ton was realized; but the relative difference in price between new and old seed was not maintained, crushers finding by experience that good old seed of the crop of 1864 yielded nearly as much oil as the new seed of the crop of 1865. Large arrivals of seed during April caused a rapid fall to £7 10s. per ton, which was about the nominal price up to the middle of August, importers generally landing rather then accept less money, although exceptional transactions took place during the panic at £7, and even under. The improved state of trade, consequent upon the reduction of the Bank rate of discount in August, had its effect upon cotton seed, being followed by an advance of 20s. per ton by the end of October. In November the deficient import began to be felt, and prices advanced rapidly from £8 10s. to £9 10s., followed by a further upward movement in December to £10 per ton, at which figure the year closes, with an almost entire absence of stock. These high prices are, however, maintained solely by scarcity, and as they leave no margin, but an absolute loss to the crusher, they must necessarily fall when large arrivals take place. The shipments from Alexandria during November and December have been small: the supply will, therefore, be very limited during the first two months of the year. The Egyptian cotton crop of 1866 is, however, believed to be large, although it will probably not equal that of 1864.

Cotton Seed Oil.—A large proportion of the seed having arrived in a heated state, the oil was considerably injured for refining, making so great a per-centage of waste as to leave no profit. The immense quantity of rape oil has also interfered very materially with the use of cotton oil, and has assisted to make the year 1866 a very unsatisfactory one for cotton oil refiners; the business, consequently, has been limited in extent. The year commenced with crude at 33s. 6d. naked, and refined at 40s. 6d. in casks. Prices fell during January in sympathy with seed, reaching 30s. 6d and 37s. 6d. respectively by the middle of February; a slight advance then took place to 32s. and 39s., from which prices a continuous and almost weekly fall resulted in quotations of 24s. 6d. and 31s. 6d. in the end of June. During the month of July crude rallied a little, and touched 25s. 6d.; but refined, influenced by speculators' resales and bear sales from London, was very much depressed, and sales were made in some instances as low as 30s. to 30s. 6d. in casks. August was distinguished by a rapid advance up to 30s. and 31s. for crude, and 37s. to 38s. for refined. These prices ruled with but little variation, and with very little business passing, till the early part of December, when the absence of demand for refined oil and dulness in other oils brought prices down to 29s. naked for crude, and 36s. 6d. to 37s. for refined, at which figures the year closes. Some little crude oil is in crushers' hands; but refiners, discouraged by the unprofitable character of the trade, will not open their refineries at the present difference between crude and refined.

Cotton Seed Cakes.—In the early months of the year the trade was depressed by speculators forcing their contract cakes on the market; during the spring and summer the demand was very limited; during the autumn the large production of rape and Rübsen cakes checked the consumption; but in the months of November and December all the cakes offering have been eagerly bought up at very high prices. The price at the commencement of the year was £5 5s., which gradually fell to £4 10s. by the end of February. In the early part of March a large demand sent the price up, and by the middle of the month the quotation was again £5 5s. During the month of April the large supply of seed and approach of summer brought prices down to £4 5s., the lowest point of the year. This low price induced speculators to come forward, and the quotation rallied to £4 10s., which was about the value till the middle of August, when an increased demand made the price £5, which was the ruling figure till the end of October, when £5 5s. was freely paid. During November and December absolute scarcity drove prices up to £6, and thence to £6 10s., which is the present value, with scarcely any stock for sale.

Olive Oil.—The imports this year, consisting principally of Gallipoli and Neapolitan, have been 6,945 tons against 7,555 in 1865, 5,195 in '64, 5,177 in '63, and 7,454 in '62. Prices have ruled very steady during the year, Gallipoli from about £58 to £61 and £62. The consumption also has gone on very steadily, notwithstanding the advance of prices, consequent upon the unfavourable reports of the crop abroad. Stock 193 tuns against 400 tuns in '65, and 569 in '64.

Flax.—The import for the year is 10,306 tons against 13,720 in 1865. The very high prices ruling in the foreign markets during the whole of the year left so small a margin for profit that our merchants have imported less than usual, and there have been fewer consignments. The quality of the flax has not been so good as that of the previous year, and the trade this year has not been so satisfactory as might be desired. Prices opened very firm in January, with a fair demand, Portuguese F.P.K. being worth £62 per ton. Small stocks and advancing rates abroad caused a speedy advance to £69 to £70, at which price this mark remained until the middle of February; the demand, however, at this extreme point, being considerably curtailed. Prices remained nominally firm to the end of March; but to effect business concessions had to be made, and these small concessions in price characterised the remainder of the year, our closing quotation for Portuguse F.P.K., being £61 to £62 per ton.

The import of Tow has been 4,209 tons against 7,104 tons in the previous year.

Hemp.—The total import for 1866 amounted to 5,075 tons, viz., 2,257 Petersburg, 2,837 Riga, and 11 tons sundries. The year opened with the price of clean at £36 per ton, receding by the end of June to £33. The inferior quality of the new arrivals in July and August caused a further decline of £2 and £3 per ton, with the exception of prime parcels of 1864, which were readily saleable at £2 per ton above the current rates. We opened the New Year with a slack trade—although the light stocks here and elsewhere, with an apparent tendency to some improvement in the demand, will probably fully maintain present prices until the new import takes place.

Cattle Bones.—The total import is about 3,000 tons in excess of 1865, and in consequence of the liberal supplies prices have ruled from 10s. to 15s. per ton in favour of buyers. The stock is about 1,000 tons, including 80 tons of bone ash, against 500 tons last year. Price at present is about 5 gs. to £5 7s. 6d. per ton, with but a small demand.

Guano.—The supplies of Peruvian into this port have been less liberal than last year, say 9,115 tons, and the demand is on the increase.

Tar.—From Finland and Swedish ports the import this year has been 24,992 barrels against 26,054 ditto last year. During the spring months prices ranged from 16s. to 16s. 6d. As the year advanced, however, prices gradually drooped. Some early arrivals this season altered the price to 14s., and later on, a still further downward tendency was shown, and lower figures submitted to. The market is, however, firmer, and 14s. to 14s. 6d. the nearest value. The present stock in all hands is about 7,000 barrels, against 6,500 barrels last year. Archangel: The import into Hull is still very small, there only being one arrival of 1,192 barrels. A reduction in its value of about 7s. per barrel compared with last season will, however, cause increased consumption, and larger imports may be encouraged. 15s. to 15s. 6d. is the nearest value.

Turpentine Spirits.—Our market is still well supplied, principally with French from Bordeaux. The import direct from foreign ports during the year is near 400 tons. Prices have fluctuated from 44s. to 48s. early in the year. Increased supplies of American spirits into England later on caused unsettled prices. French is now worth 37s. to 37s. 6d., and American 38s. to 38s. 6d. Crude Turpentine: No direct imports worth notice.

Rosin.—Our market continues to be abundantly supplied, mostly from Bordeaux. Increased imports into England from

American ports has caused much lower prices to be accepted, especially for the finer kinds suitable for soap making, and for which qualities the French makers bid fair to outrival the American. The finest soapers' rosins are worth from 14s. 6d. to 18s.; medium amber, 11s. 6d. to 12s. 6d., and common kinds for distilling, 9s. 6d. to 10s. 6d.

The abolition of all duty on WOOD GOODS, in March last, to which may be added the low rate of freight from the Baltic ports, gave great encouragement to the importation of low and inferior qualities of deals and boards of every variety of dimensions; a class of goods never before imported, and which, but for the very low cost, would not have found buyers. It is now difficult to say the purposes to which some of them are to be applied. The above cause, added to the effect of a high rate of discount during the summer, led to a general depression of prices, and a somewhat sudden curtailment of the American shipments. The stocks in hand are estimated to be somewhat less than they were on the 1st of January last, while the importation has been somewhat more in 1866 than in the previous year. The present low rate of interest, with the abundance of unemployed capital, combined with the increasing confidence, will, it is hoped, lead to a speedy revival of the timber trade from the depression which it has recently suffered, and make the coming year one of greater prosperity than the last. The import of sawn wood in 1865 was 203,578 loads; 1866, 218,753. Hewn wood, 1865, 55,706 loads; in 1866, 51,467. Total, in 1865, 259,284; in 1866, 270,220 loads.

COALS.—The export trade this year is 168,764 tons, against 190,734 tons in '65. Although the exports may not keep pace with neighbouring ports, still the annual consumption by our large steam trade causes the demand to be quite equal to the supply. Prices are on the advance, and likely to continue. Coal at the pit mouth is fully 1s. to 1s. 6d. per ton dearer, and the carriage by water is 6d. per ton higher than for an average of years; and this, to all appearance, is likely to increase. An advance of 6d. per ton is at present in agitation by the different railway companies on all minerals. Also, the colliers work so restrictedly, that not two-thirds of the quantity is got. The average time of labour of a hewer or collier in the South Yorkshire district is now reduced to about 32 hours per week. This accounts for the short supply of coals, and materially checks our export trade.

SHIPPING.—American freights have been very much depressed this year, ruling about 28s. timber, 80s. to 82s. 6d. dry deals from Quebec to Hull and Grimsby, 80s. Saguenay. From the lower ports next to nothing has been done on this side, as tonnage always offered plentifully on the spot at very low rates. Erom the Baltic a better business was done at the commencement of the season. Freights from Cronstadt to Hull or Grimsby opened at 46s. 3d. deals, and advanced to 50s.; but declined to 47s. 6d. again for the second voyage, and closed at 40s. Wyburg to Hull 55s., Grimsby 52s. 6d., West Hartlepool 47s. 6d. to 50s. was first paid, but these freights also gave way, and finally business was done as low as 42s. 6d. Fredricksham to West Hartlepool. Gefle to West Hartlepool was done at 45s. and 43s. 6d., Hull 45s., Liverpool 68s.; Bjorneborg 52s. 6d., and 50s. Hull; Monksound 57s. 6d.; Narva and West Hartlepool 55s., Riga 48s.; Gothenburg and Hull, 30s.; Archangel and Hull, 4s. 9d. seed. Freights for steamers in the Cronstadt trade ruled low, not at any time reaching the rates current at the best times of preceding years by 1s. 6d. and 2s. per qr. From the Prussian grain ports trade was also very dull until late in the season, when a demand sprung up at 4s. to 4s. 6d. per qr. wheat, Hull; 5s. London; 5s. 6d. to 5s. 9d. Antwerp; 6s. Rotterdam.

P. BRUCE.

Hull, Jan. 3.

THE PRICE OF BARLEY UPON THE REPEAL OF THE MALT-TAX.

Who can answer the question? Will repeal raise the price of barley? Will it make less distinction between the price of best barley and medium quality barleys? Will the growth of barley be greatly increased thereby? Will the price of beer be much lowered? Will the number of common brewers be much augmented? Will private brewing become general? Will the beer itself be greatly improved? Will maltsters derive much benefit by the repeal? Will private malting be much adopted and practised? What advantage will be derived by the public from repeal? It is a far easier thing to ask questions than to answer them, particularly in a satisfactory and intelligent manner. However, I am so satisfied that the bulk of the community seldom inquire into the precise nature or practical working of any measure, that I am induced to offer, in my plain way, some observations and speculations upon the probable effect upon the growth of barley and the brewing trade by a total repeal of the malt-tax.

Let us take a few plain facts to begin with. Take the total quantity of malt used in brewing to be nearly 5,000,000 quarters: upwards of four-and-a-quarter millions are used by common brewers. It is said, and we may affirm it without much hazard of contradiction, that any one of the three largest brewing establishments in the metropolis requires annually for their own separate uses more than all the eastern counties put together can produce; and one of them, it is further said, would require nearly all Lincolnshire to help out. Can this be right? Does not this show a monstrous monopoly, and that it requires great capital to pay the malt-tax—*i. e.*, to be a brewer? Small capitalists seldom do well in the brewing trade. Take the enormously-large Burton brewers: what capital is there involved! and many instances elsewhere are found of like extensive establishments, all tending to prove that brewing is a great monopoly, a prejudicial monopoly, created in a high degree by the heavy outlay requisite to keep up a supply of malt. Maltsters are in a precisely similar position as respects capital. They have the first demand to meet, the tax to pay. Take off the tax, destroy the monopoly, and malting and brewing would become almost universal—at least, in country districts. The processes might not be so cleverly accomplished, but maltsters' and brewers' profits would be for the most part saved, and a more wholesome drink would no doubt be produced. I take these to be facts.

But to my questions. Will the repeal cause a rise in the price of barley? I venture the assertion that it will, and more particularly inferior barleys, and, as a natural consequence, other barleys would derive a similar advantage too. And why should it not? Barley is, and will be, chiefly grown for brewing, although in part for distilling purposes. This I venture to assert also, because, as feeding stuff for stock, it can easily be supplanted by foreign importations, and by the more general use of Indian corn and other cheap grain, which is already largely in consumption. It is always vauntingly put—You can never expect the price of barley to equal the price of wheat! But I say, *Indeed I do;* why should it not? I will also reply, You never expect to brew such good beer from malted wheat as from malted barley. Wheat is used mainly, and rightly, for human food; barley—*i. e.* malted barley—is and will be chiefly applied in the provision for human drink. Only take off all restrictions and imposts, and see if it won't go ahead. Good beer is in reality far more valuable than champagne or like similar drinks; iron is more beneficially useful than gold. The consumption of beer, particularly of home-brewed beer, would be enormously increased. It is the adopted beverage of every class, and it is only the poorer part of the population that are debarred its free use. The inferior barleys would come into general use for the general public, and therefore be in greater demand for malting and brewing, as, not having any tax to pay, they would be malted, and the first and highest-class barleys would, I anticipate and verily believe, reach fabulous prices? And why? Because the trade in brewing will undergo a great change and a thorough revolution. Our monopolizing brewers will find their trade for common ales wonderfully fall off, from the increase of small breweries and the love of home-brewed. Hence they will turn their principal attention to the production of fine ales, ales of splendid quality, so fine as were never before produced, and such as are even well calculated to supersede our cheap foreign wines. For this, malt of most beautiful quality and colour must be forthcoming, and must be provided, to achieve this most needful desideratum. Price will be of no object or account; it must be had. Growers, knowing this, will redouble their efforts to obtain the finest varieties or sorts of barley, and to produce their crops of a quality to meet such demands.

Will it make less distinction between the price of best barleys and medium quality barleys? My opinion is that it will make a wider distinction than now exists. Inferior or medium quality barleys will undoubtedly improve in demand and price, owing to the increase of minor brewing establishments and private ("home") breweries. But the barleys of finest quality and beauty of colour will quite exceed in price every estimate hitherto formed of their ultimate value; as I have said, I believe they will realize fabulous prices, hence the greater distinction between the two.

Will the growth of barley be greatly increased thereby? Unquestionably it will. If a great extension in brewing is to take place—as undoubtedly it will—the demand for malt must be met. But that is not the chief point; it is that a vast increase in the consumption of beer will arise, and will require both inferior and best barleys to provide for it.

Will the price of beer be much lowered? I think by no means to the extent supposed; but common ales will be reduced to the full extent of the reduction of the tax, and probably further by unrestricted trade in brewing, and the use of inferior qualities of malt from inferior barleys.

Will the number of common brewers be greatly augmented? As the malt-tax locks up some £6,000,000 of capital, much of which brewers might employ, it is reasonable to suppose that if this sum were remitted very many small capitalists would take advantage of it and commence the business of common brewers.

Will private brewing become general? It would become pretty general in all country districts where families possess requisite facilities, but not in towns. The knowledge that householders can make and use their own malt would aid much in promoting this.

Will the beverage itself be greatly improved? Certainly; the temptation to adulteration will not be so great, and the common run of ales would be brewed after a higher standard than now—*i. e.*, more malt to the barrel. The very finest and best ales would be subject to a laudable rivalry amongst brewers and be greatly extended, which would lead to their improvement too.

Will maltsters derive much benefit from the repeal? Undoubtedly they will. The capital of £6,000,000 now paid as the tax is divided between the brewer and maltster; but the maltster has to make the first payment, requiring thus about one-third more of original capital to carry on his business. Upon the sale of malt this is returned to him by the brewer; both, of course, upon the repeal, would be benefited by being enabled to carry on their business with that amount less of capital; besides, there would be more barley to malt.

Will private malting be much adopted and practised? I believe it will; but I doubt the policy of so doing. Malting is a specific business, requiring great care, knowledge of the process, and judgment. It is, and can be, done with much greater accuracy and advantage to the barley malted by the maltster than can be accomplished by private means. True, farmers and others may steep their barleys and grow them, but facilities for drying are seldom at hand. Probably hop-growers may advantageously do this in their hop-oasts. Illicit distillers amongst the Irish mountains steep in the lakes and dry in the sun. It may, therefore, be done if farmers will do it; the question is as to the best course. Wetted and grown barleys in bad harvests may be profitably dried for brewing, but good barleys should go to the maltsters.'

What advantages will the public derive from its repeal? This is the main question, and requires careful examination. The public must find a substitute. The tax or the amount derived from it cannot be spared. Beer I take to be one of the necessaries of life to the inhabitants of Great Britain. It comes into every day's consumption, after the same order as tea, coffee, cocoa, sugar, &c., and ought to be taken as a beverage or superior drink to these, and not as a luxury; it ought, therefore, to be as free from taxation as any of these, or lowered in proportion at least. All necessaries of life ought to be free from taxation; all luxuries and unnecessary aids to higher life, or additional style and ornamentation of life and comfort, should bear taxation instead; but not all these. There are innumerable accessories to our family comforts, and necessary to different styles of life, that derive all their value by being adopted and purchased by the upper ranks of society; thus are our trades and manufactures supported. To tax these various articles and fabrics of manufacture would be to tax native industry—a truly great folly. But there are many things of almost universal consumption which are not absolutely necessary to any condition of life, and which do not enter largely into industrial employment, *i. e.*, wines, spirits, tobacco, fruit, and indeed whatever may be deemed a positive luxury and not requiring great labour in the production; these ought to bear the chief burden of taxation in an advanced state of society in any country: it is upon these luxuries or common indulgences that taxation should be heavy, to the relief of the requisite and necessary. The common people, whose means are scanty, ought not to be taxed, or but lightly: they are mainly *the British public*, and at present paying a large amount of taxation, *i. e.* in tea, sugar, tobacco, and *beer*. If the tax on malt or beer were repealed, this class could not fail to be benefited, as I have shown already; besides, what a large amount of labour is paid in beer! every working-man calculates so much money and so much beer in his daily wages; any reduction in the price of beer must therefore be a boon both to employer and workman. I say, then, that the public would be greatly advantaged. But the malt-tax cannot be spared; well, let it be put upon the same footing as tea, coffee, cocoa, and sugar, according to value; or, what would be far better, put the chief tax upon those almost unnecessary articles wine, spirits, tobacco, fruit, &c., and let the working population go as free as possible. The partial tax upon beer would be a great relief from the present oppressive import. It would set the trade in malt free—it would extend and increase the trade of brewing—it would cause a great extension of private brewing—it would require less capital. The common brewer paying no tax upon malt would only be called upon to pay tax upon beer as he brewed it. The private brewer would only be called upon to take out a licence for brewing according to the extent of his requirements.

P. F.

THE LEICESTERSHIRE CHAMBER OF AGRICULTURE.

The inaugural dinner took place at the Bull Hotel, Leicester, on Saturday, January 5, under the presidency of the Duke of Rutland, the lord lieutenant of the county, who was supported by over 100 members and visitors.

The Noble Chairman, said that he had received letters of apology for non-attendance from Mr. Packe, M.P., who was of opinion that such associations were established 20 years too late, that it was high time the farmers had been aroused to a sense of the mischiefs of modern legislation since the establishment of free trade. It was an undeniable fact that the position of the British farmer had not had a fair share of the consideration of Parliament. Too much attention had been paid to the British manufacturer in competing with foreign countries; and when farmers had met for the purpose of complaining of a grievance, they had been met with the cry of "No politics." It was an insult to common sense that where the pocket suffered the cause of it should not be probed to the bottom by discussion. The Chairman thought he might sit down by saying that he fully endorsed the sentiment. After apologising for the absence of his brother, Lord John Manners, who regretted that he was unable to be there, as he left him in bed with an attack of illness which had prevented his attendance at the Cabinet meeting on Thursday, he said their object was to bring before the Legislature any grievance that they thought they laboured under, and to induce the Houses of Parliament to consider and respect their rights and redress their grievances. They thought that of late years the weight that was due to agriculturists, the largeness of their body, and their wealth, had not been duly attended to in the Legislature; and it was for the purpose of bringing to bear upon the Legislature their wishes, feelings, and grievances that the Chamber was established. He believed they would agree with him that, for the useful and profitable working of the Chamber, it was important that party politics should be excluded, but only party politics. They might consider any question, whether the malt-tax, the toll-bars, or anything else coming under the term of politics, but nothing relating to party. They cared not for the politics of any man so long as as he gave them his vote in the House. It was right also that all internal jealousies should be done away with, and, if they meant the chamber to be useful, they, must lay aside all small prejudices, so that landlord and tenant foreman and labourer, might unite in supporting it. He would not touch upon the various questions to be brought before the Central Chamber, much less would he venture into the question of the malt-tax, or the toll-bars, for their great object was to put a stop to injustice. Therefore he hoped he should not be considered to be bringing forward a question that was altogether irrelevant to the object of their meeting if he ventured to refer to a subject that was mentioned the other day by the great agitator of the day, Mr. Bright. In order that he should not misrepresent the honourable gentleman, he would quote the whole of the paragraph which he had copied from the papers. On the 5th of last December Mr. Bright, in a speech, said: "Again, in 1846, although every intelligent man in every country in the world admitted the justice and the force of our argument against the corn laws, still it required the occurrence of a crushing famine in Ireland—a famine which destroyed as many lives in that country as would have been destroyed by a great war, and which drove into exile as many of the people of that island as would have been driven into exile by the most cruel and relentless conquest—it required all that, before the Parliament of England, the men among whom I sat, among whom I sit now, whose faces are as familiar to me as those of any person whom I have known in life—I say it required all that, before they would consent to give up that intolerable wrong, and cease to tax the bread of an industrious community." Now, if he was alone concerned in the paragraph, he should sit down; but there were those alluded to in it who were now no more, who had been called away, and whose characters were reflected upon. He was glad of the opportunity of vindicating the memory of as great, as patriotic, as honest, and as straightforward politicians as the country had produced. There was no doubt those sentences were uttered in order to prejudice the people against what he might call the governing party; but in point of fact, it really did not touch them; and if referred to anybody, it was to the late Sir Robert Peel, and to Mr. Bright's friend, Mr. Gladstone, and to no one else. Who was it that gave up the contest for Protection on the grounds of the Irish famine, but Sir Robert Peel and his followers? He believed, nevertheless, that they were actuated by pure and patriotic principles, but that they had conscientiously changed their opinions. But when the Irish famine and the lives of the Irish people were laid at the doors of those who to the last defended the protection which they believed to be the best for their country, he repudiated any such imputation. He said that not so much on his own behalf as on the behalf of Lord George Bentinck, than whom there was not a more noble or more conscientious man. Why did he adopt the course he pursued at the time of the Irish famine? Why, because—whether rightly or wrongly, he would not say—he conscientiously thought that the famine was to be met by other and different means than by the repeal of the corn laws. He thought it not a question of food; but that it was a question of bringing the food to the mouths of the people. He thought what they wanted was the money wherewith to buy the food, and he proposed that the people should be found employment, and he therefore proposed a vast scheme of Irish railways; and who could tell, if Lord George Bentinck's proposition had been carried out, it would not have been successful, or that the Irish famine might not have been mitigated; and who could tell, if he had been successful, that the emigration which followed would never have taken place, and that Fenianism, of which we heard lately had so much, would never have been heard of? Now, he gave Mr. Bright credit for conscientious motives; but he said this, that a politician who could take so low a view of his fellow-labourers—who could believe not one, two, or three men, but that a large body of English gentlemen could be so actuated by selfish and unpatriotic motives—that the man who really believed that (and if he did not believe it he would not say what he thought of him), and took such a low view of his fellow-countrymen as that, had not those great, those ennobling, and those judicious qualities of which our statesmen and our patriots are made.

Lord Berners gave the toast of "The Central Chamber of Agriculture." In doing so, he said such societies were meant to bring in the strongest bond of union the landlord and tenant farmers and their workpeople. Such was necessary, because the landed interest had not received from the Legislature that justice which they ought to have received on many occasions. To show the necessity of such, and that a proper stand should be taken in Parliament when any agricultural measure was brought before it, he would state that as far back as thirty years ago, whenever anything occurred to affect the landed interest, it failed for want of co-operation. Mr. Huskisson, when he first tampered with the fiscal regulations connected with agriculture, by taking off the tax upon hemp and flax, which were produced by the farmer, increased the tax upon oilcake, clover, and other grass-seeds. When a remonstrance was made, they were met by the cry that it was too late. A similar society to that was established in 1835, in consequence of politics being entirely excluded from the agricultural associations; and, with the aid of the central and sixty-seven local societies, exertions and petitions were sent to the King; and, the next session, the claims of the agriculturists were acknowledged in the speech from the throne, and redress promised to their grievances. Soon after, the society failed, in consequence of the indiscretion of one or two of its members; but, in 1846, a special committee of the House of Lords sat, and took evidence, which resulted in the redress of the grievances. One great injustice at the present time was the inequality of the rating of the country, a question which the whole of those connected with the land should look well into. The total sum received per year was something like £9,680,000, and the expenses for the administration of the poor-law only £6,423,000, the other charge amounting to very nearly £3,000,000, which charges were quite distinct from relief of the poor. Why was the expense of registration, vaccination, &c., which amounted to about £173,108, thrust upon the land? When the question was asked in the House of Commons, the Chancellor of the Exchequer replied, because there was no other class that would like to bear it; they did not know where to put it. It was wrong that one-third of the whole of the poor rates should be spent in four or five items unconnected with the relief of the poor, which was equal to 23 per cent. of the income tax.

Mr. A. **Pell**, chairman of the Central Chamber, said the society was established on the principle of the chambers of commerce at Manchester and Liverpool, which meddled in politics, the former sufficiently to make them feel it with effect, it having boasted that it associated itself with those measures which led to the final repeal of the corn-laws. It was therefore the farmers' business to take care of themselves, and he repudiated asssertions that it was a Radical or Conservative movement. They desired to elevate the labourer, and it was monstrous to blame the farmers for the present condition of their servants while such small profit could be derived from the land. It was a great injustice to put a tax upon that which was the very life-blood of the labourer on a harvest-day.

"The Borough and County Members" having been given, Lord Curzon and Mr. Hartopp, two of the county representatives, responded, expressing their approval of the organization of such an association, and the latter hoping for a removal of the obnoxious malt tax. If they did not get it removed in the next session, they would not in the following; for their efforts would be frustrated by the wild schemes of some persons who would convert our time-tried constitutional monarchy into a miserable republic. He was convinced that whatever reform the English people required ought to be carried out in such a spirit has to consolidate our constitution.

The toast of "The Town and Trade of Leicester" having been drunk, Mr. T. Willson (the secretary) gave "The Visitors," which was responded to by Viscount Ingestre.

Mr. C. S. **Read**, M.P. for East Norfolk, referred to the malt-tax, which he hoped to see abolished. It was said that in Norfolk they were protected by the malt-tax; but if protection were tying the leg of a man when running a race, he would rather be without it. In Norfolk they were not benefited as much as the farmers in Leicestershire. The only persons really benefited were the brewers, and not the farmers. As to the question of labour, any burden that fell upon the land must eventually be felt by the landlord. If a police-rate were increased 0½d. or a county-rate 1d., that fell upon the tenant entirely; but when they came to an important question like labour, if it were a case of 25 or 30 per cent., it was impossible for the tenant to bear the brunt, and therefore it must affect the landlord. And there was no co-operative labour unless a landlord was a party to it. If they were to have co-operation, let the landlord take three-fourths of his rent, let the tenant take another portion, and the remainder be equally divided between the tenant and labourer. He should be glad if the settlement laws were entirely abolished, and when the labourer was set entirely free he would feel the benefits of recent legislation and be independent. Farmers were in a different position from a manufacturer who was not aware of the number he employed; but they did know whom they had engaged on their land, and they had many means of helping a poor man and his family, which he hoped they would carry out. It was not by actual money payment that they could do the labourer service. They could often call the attention of the landlord to his position; they could give him garden ground, cart his coals and his wood, and he was sure that the comforts of a farm kitchen would be much enhanced by a just distribution of the refuse of their dairies, &c., to those who needed it. So deeply did he feel the responsibility of a tenant farmer that he said, if at the close of each day they did not feel a happy conviction that they had done something to make those about them happier, they had not done their duty in that state of life in which it had pleased Providence to place them.

THE GIFT OF A LABOURER'S CLUB-ROOM.

On Friday evening, the 28th of December, a meeting was held at Bardwell, Norfolk, for the purpose of accepting the offer of a new Reading-room for the labourers of the parish, made by Mr. G. Kersey Cooper, of Euston. It is a handsome edifice of red brick and flint, 30ft. in length and 15ft. in width, fitted up with tables and seats on the Windsor model, sufficient for 50 men, with accommodation for more, if necessary. A small room leads out of it, for providing coffee at a halfpenny a-cup. The weekly subscription is a penny, and draught-boards and dominoes are provided also, besides a good supply of newspapers and periodicals. The whole has been provided by the founder at a cost of £200, and made a free gift by him to the poorer inhabitants of the parish, where he holds a large occupation. The principal occupiers and others were present on the occasion, with a large number of labouring men and lads.

The rev. A. P. **Dunlap**, being called to the chair, said: The name of Mr. Kersey Cooper was well known to them all for many previous instances of judicious and well-timed benevolence; and now, to his other acts of kindness and consideration for their welfare, he had added this one, which he had designed for the improvement and recreation of their leisure hours, after their return from their daily labour, and when they most needed refreshment and repose. He did not (as he understood his feelings) mean it as antagonistic to any other interest or attraction, if they preferred such. He did not wish to interfere with their movements after their work was done, which were entirely then at their own disposal; he only wished to set before them one other attraction, which offered them "innocent" amusement, (a name well suited to that day on which they were met together) which offered them wholesome food for their minds, and a pleasure which brought no sorrow. For himself he, as rector of the parish, begged to tender his warmest thanks to Mr. Cooper for this boon to his poorer parishioners, and sincerely trusted that they would receive it in a right spirit, and show their gratitude to him by availing themselves of it, as he so earnestly desired; and while grateful to him for such an expression of his feeling and sympathy with them, they would be thankful above all to that Almighty Being who could alone put thoughts of kindness into the heart of man, and alone bless his feeble efforts for their present and future good.

Mr. **Cooper**, on rising, said: I can assure you, my friends, it affords me very great pleasure to meet you here this evening, and offer for your acceptance the use of this room for your social comfort and improvement. I have long felt that the working man is a social creature, and feels the same pleasures in the interchange of thought as those in higher classes enjoy; but when the toils of his day are ended, and his supper is over, he is often unable, from the limited size of his cottage, and the domestic duties of his family taking up all the vacant space, to ask a friend or two in to spend a few hours with him. I hope, therefore, that this building will give you the opportunity of doing so, and in part meet what you need; and it will be the endeavour of myself and my friends to minister to your entertainment and improvement in it by a supply of such papers and periodicals as will amuse and instruct you, and enable you thus from time to time to know more of what is passing in the age in which you live. My great desire is to see the working classes elevated in their tastes and habits, and feel a higher respect for themselves; for without this, they will not obtain the respect of others; but the more they do this, the more likely are they to become not only better but happier men. I sincerely trust that this little offering of mine will help them to become so. The rules have been framed for the regulation of it with much consideration and care, and I can only say, in conclusion, that I shall be more than repaid if I find that you take advantage of it and become members of it, and that it ministers in some degree to your comfort and instruction, or furthers in any way your best interests here.

Mr. **Greene**, M.P. for Bury St. Edmund's, said: I feel sure that I am speaking the feelings of Mr. Cooper when I say he does not offer you this reading-room as an act of charity, but as a testimony of his good-will to the working men, and a desire to fulfil his duty as an employer, and one to whom God has given the power. He desires to give the labouring men of Bardwell an opportunity of enjoying themselves in a pleasant and rational manner, and improving their minds after the hard labours of the day are done. I join most heartily in this good intention of his, and I trust it may be known far and wide, and lead others to go and do likewise. It is a need greatly felt in country parishes, which he thus endeavours to supply, for I fully agree with him, my labouring friends, that you need the relaxation of meeting one another in social intercourse, which you are not able to do at your own homes. It will be a boon to you indeed, if you embrace the opportunity now offered you, as you must remember you have minds to be cultivated; and although hard work is a necessary part of all our lives, still God has given us a higher nature to improve, and if we only eat, drink, sleep, and work, we are leaving in a barren state that which will give us the greatest enjoyment. Your friend, Mr. Cooper, has rightly said, if a man wishes to be respected he must respect himself; you may rest assured this is true. Much has been said of late by political agitators to make the working man think the laws of his country prevent him from rising in the world; this is untrue, and mere political claptrap. There is no royal road to prosperity and happiness, but by fulfilling the duties of our stations, honestly and industriously, whatever our position may be. The success of every man in life, under God's blessing, is in his own hands, by taking advantage of his opportunities. My friend Mr. Cooper now gives every man, however humble his station here, an opportunity of fitting himself to rise in the world, or at least of better filling his place in it. I trust it may be so; that it may be the beginning of a new era in this parish of Bardwell, and that you will find in this comfortable room, with its bright lights and warm fire, a constant source of quiet enjoyment in friendly intercourse with each other, and in self-improvement too.

Mr. HERMAN BIDDELL said, My idea is this: After a labouring man has done his work for the day, and eaten his evening meal, there comes an hour between then and bed-time, which, as some at least are situated, is not always comfortably passed by the family fireside. More especially does this apply in the case of some I see before me—lads from 16 to 20 years of age, who, not having a household of their own, are old enough to feel the inconvenience of an over-crowded room at home. It may be the little folks of the family become noisy and troublesome; and if the mother take in washing perchance the room is full of reeking linen, and it may be that the night is wet, in which case the only alternative is the public-house, where I have no doubt many in this room are occasionally to be found. I don't wonder at it. I am inclined to think if I were similarly placed I should go myself, but mark what I am about to say on this point. I have no fault to find with a man because he occasionally goes to the beer-shop to get what he can't find at home, but of this I am perfectly certain—that there's no man, either old or young, who makes a resort to the beer-house his constant habit—who always goes and always drinks—I don't care who he is, or what he may be, there's not a man who if whenever he has a sixpence to spend or an hour to spare regularly goes to the public-house, but who sooner or later drinks to excess. What that leads to is pretty well known. Some of you, for aught I know, may have the habit. Your home may be uncomfortable; and the beer-shop has its attractions, and hitherto, as I said before, may have been your only alternative; but remember, with you at least, the case is altered now. Here is a room, comfortable, warm, and well lighted, and at the same time almost free of expense. It is not in every place that there is one with the means to do for its poorer classes what has here been done for you; and more seldom still with the will to use for such a purpose the means which are at command. By this I don't mean to say that it is incumbent on every one in your friend's position to do as he has done, although I earnestly hope his example may be followed in other parishes; but you must bear in mind he has done his part—now, do yours; show that you appreciate what he has done for you by taking advantage of the opportunity offered. I am not speaking to you as one unacquainted with the class to which you belong. I have been associated with the agricultural labourer all my life, and know how much you have to contend with, and how like mockery it seems to be told to better your condition, to raise yourselves in the scale of society, without pointing out the means by which it is to be done, and without considering the little your all is composed of. Don't think because you are recommended to take pleasure in pursuits hitherto regarded as belonging to another class that your position, your means, your circumstances are overlooked; nor imagine that while you are invited to try the enjoyment of reading and harmless social intercourse your daily occupation is held up to you as a degradation, or your means of livelihood no longer as an employment of honourable respect. Far from it. There may be as much true honour in the man who holds the plough as there is on the head of the greatest of the land; and be your daily labour but to feed the ox or tend the herd, there is as much respect due to you, if your duty be but honestly performed, as belongs to the duties of the Prime Minister of England. Each of us has undoubtedly a mission in life, but it is not so much what that mission is as how that mission is performed. And now let me say one word to the young men who are here to-night. I understand that your club-room table will be supplied with periodicals, papers, and magazines. Now, I dare say, there are not many of you who are in the habit of reading the public papers; but let me tell you there is a fund of amusement as well as instruction in these things you are little aware of; and provided the magazines and papers you read are conducted on conscientious respectable principles you will have no cause to regret the time when you first took to reading them. You may have the idea in your heads that such amusements are only for the upper classes, for those who have money and time and education, and for them only. No such thing. Who knows what learning to read may lead to? George Stephenson, the great engineer, who may be said to have instituted the railroad system of this country, was at first but a labouring man in a mine; and did time permit I could point to numerous examples where men by their own exertions have risen to eminence only by cultivating their natural talent by education, and who, I would remark, had no advantages peculiar to themselves: the great secret of their success in life being that they made the most of what they had, and that, recollect, is what every man in this room can always do. I do not mention these things to impress you with ideas you can never carry out, nor to foster visions of ambition which should make you look upon the occupation of the labouring man as a degrading means of earning a living, but to impress upon you the fact that all depends upon the individual himself, and not on the advantages that individual possesses. In conclusion I have one word of advice to offer. It may be in the social meetings, many of which I hope you are destined to have, that you may discuss subjects upon which you are not all of a mind. Let me caution you one and all to receive with respect the opinion of those who may happen to differ from your own. Recollect every one has a right to his own opinion, and be he young or old, simple or gentle, you are bound to receive with respect the judgment of all those with whom you are brought in contact; and though you may differ in your views, to differ always with temper and moderation.

Already fifty-eight labouring men and lads have entered their names as members, while their regular attendance, even in the late inclement weather, proves their desire to avail themselves of the Room.

FERTILIZING AGENTS.

At the last meeting of the Boroughbridge Agricultural Society, Mr. BAINBRIDGE said that he had been honoured by the society in being requested to give a paper on Fertilizing Agents on that occasion, but he had not prepared a written lecture, and would make a few general remarks on the subject in the hope of provoking a little discussion. The great thing for any person to secure success in life was to take a pleasure in the business they had to follow, and, whatever their occupa-

TRADE OF THE PORT OF HULL.

REPORT FOR THE YEAR 1866.

It is matter of congratulation that during the past eventful year the commercial credit of this great port has been well maintained, and remains at the present moment in a very satisfactory condition. The failure in the metropolis of the eminent discount-house, and the collapse of so many of the limited liability companies, brought on a panic in the money market, which caused the Bank of England to raise its discount to 10 *per cent.* This serious and oppressive rate continued for the long period of *fourteen weeks*, the effect of which was, unfortunately, to give a check to the legitimate trade of the country, as well as to depress the market value of all articles of merchandise, and thereby to occasion inevitable losses to many unoffending parties. Notwithstanding this check, it is gratifying to report that the trade of the port during the year has considerably increased.

Wheat.—The wheat trade of the past year may be characterised as a prosperous one on the whole: the fluctuations in prices after the month of April have been almost entirely in favour of the holder, and a gradual improvement since then has taken place, which may be attributed to a moderate import, a not very bountiful harvest in this country, and a decidedly inferior one in France, which latter country during the first half of the year was a very large exporter of flour and to some extent of wheat, and is now competing with us in buying for her own actual wants, not only in foreign ports but in our own markets. Although we are unable to give a return of the English wheat exported during the year, it is certain that France and even Belgium have taken a considerable quantity from our shores, and within the last few days the demand has revived and shipments are actually again taking place from this coast as well as the Baltic provinces to France. We began the year with a stock of 120,000 qrs., and close it with 60,000 qrs. in granary, our imports for the year being 235,078 qrs., against 273,787 qrs. in 1865. Dantzic again takes the lead, contributing 111,048 qrs., against 156,830 qrs. in 1865. The total imports of wheat and flour into the United Kingdom are about 6,907,300 qrs., against 6,141,358 qrs. in 1865; 7,065,145 qrs. in 1864; 6,604,142 qrs. in 1863; and 10,752,929 qrs. in 1862. From Egypt we have again had no wheat, and very little from ports east of Gibraltar has found its way to our market; while from Spain the quantity has been larger than for some years past, and as the harvest in that country has again been a favourable one, a similar quantity may be exported during the current year. The inferior crops of 1865 in the Baltic provinces and Holland have not been suitable for this market, and consequently the trade in wheat with Konigsberg and Stettin has been only to a small extent. Last year's crop promises better in every respect, and we may hope to see these ports again exporting their usual quantity. Dantzic has shipped nearly the whole of its stock of old wheat, and this year's supplies from that port must necessarily be almost restricted to the crops of 1865 and 1866. The former proved a poor one, and not much of it exists; the latter promises good quality on the whole, although some shipments already received indicate wet weather during harvesting. In January, 1866, the prices opened for English red wheat at 46s. to 48s. to 50s., for choice white Baltic 56s. to 59s., and for red 45s. to 46s. per 480lbs.; the markets remained quiet till April, when the lowest point during the year was touched, namely, 43s. to 44s. for English, 54s. to 56s. for choice white, and 44s. to 46s. for red Baltic; in May prices advanced 2s. to 3s. per qr. for English only. Foreign remaining stationary. During this month a war between Prussia, Italy, and Austria was imminent, and the rate of discount rose from 7 to 10 per cent. in three days; in June the war began, and finished the first week in July, when prices rose 9s. to 10s. per qr. on English, and only 3s. to 4s. per qr. on foreign; in July and August they receded 6s. to 7s. on English and 2s. to 3s. on foreign; showery weather towards the end of August and heavy rains early in September caused some apprehensions for the unsecured portion of the new crops, and prices again hardened, advancing 8s. per qr. upon old English, and 5s. upon foreign; new English red opening at 47s. to 50s.; in October old wheat became much sought after, and stocks diminished fast, upon which prices again rose 3s. to 4s. per qr.; in November new English was found to be only a moderate yield, and mostly damp in condition, so that prices remained nearly stationary, while old again advanced 3s., and foreign 3s. to 5s. per qr.; during the last month business was not so brisk, as the millers had bought freely beforehand, and although sales were made with difficulty, prices underwent scarcely any change, and we closed the year with a firm tone, and with new Yorkshire red at 54s. to 58s., old 61s. to 63s. per 504lbs.; choice old Baltic, 70s. to 72s., and red 60s. to 63s. per 480lbs., being an advance upon the year of 12s. to 15s. per qr. on English, 12s. to 13s. on white Baltic, and 15s. to 17s. on red Baltic. Russian sorts have been almost entirely cleared out: prices opened in January at 44s. to 45s. for fine, and closed in December at 58s. to 60s. per 480lbs., with scarcely any offering. The official averages for the price of English wheat for 1866 was 49s. 10d.; 1865, 41s. 10d.; 1864, 40s. 2d.; 1863, 44s. 9d.; 1862, 55s. 5d. per qr.

Barley.—With liberal importations from abroad, and a considerable advance in prices in the preceding year, we were not prepared to report this year nearly twice as large arrivals, and a further important advance in prices both principally occurring during the last three or four months of the year; but such is the fact, and this is owing to the miserable yield, especially as regards the quality of the English crops, particularly in the large agricultural counties of Yorkshire and Lincolnshire; and to a much larger extent than last year are our maltsters dependent upon foreign supplies; but happily, other countries have been favoured with a better harvest. Our closing prices for malting are 5s. to 10s., and for grinding 2s. to 3s. per qr. above those current at the end of last year, viz.; fine English malting 44s. to 52s., Danish two-rowed 42s. to 43s., and stout grinding 35s. to 36s. per 448lbs. The stock is larger than usual, but a good portion of it belongs to a few of our largest maltsters, who are holding it for their winter use.

Oats.—Our import of this grain has also been about double that of last year, but prices have undergone but little fluctuation, and are now about the same as at the commencement of the year, being to-day for good new English 25s. to 27s. for 336lbs. The stocks are somewhat larger, consisting of Russian and Swedish; but a large deficiency also of the English crop of this cereal has to be made good by foreign grain.

Peas.—We have had a poor yield of our own crop, and the importations from abroad have been comparatively large in consequence. Prices have gradually advanced, and are now 2s. above the average of last year's closing rates, being at present 41s. to 42s. for 504lbs. for good white feeders. Stocks about on a par with last year's.

Beans.—The crop has turned out rather better than at one time apprehended, and prices, which in October and November had taken a start of 4s. to 5s. per qr., have again receded, and are now only 1s. per qr. higher than a twelvemonth ago, being 44s. to 46s. per 504lbs. for good Hamburg and West Coast middles. Stocks have rather accumulated.

Agricultural Seeds.—This trade has been characterised the past year by more than ordinary fluctuations.

Red Clovers.—As the season advanced it became apparent that the demand for this seed was unusually limited, and, as some had predicted in many districts, the fearful ravages of the cattle disease caused much less seed to be required than would otherwise have been the case; and thus prices gradually declined all through the season, and at its close were something like £20 per ton lower than at the commencement. The new crops this year (with the exception of the south of France, where a fair quantity of fine seed has been secured), in consequence of the cold, wet, and ungenial summer, are very unfavourably reported of. The English crop, we are informed, in many districts will not yield sufficient seed to pay the expenses of thrashing, and what little has been grown will be very brown and inferior in quality; the same remarks apply to the principal seed-growing districts on the continent, and thus prices have very considerably rallied, and are in fact higher than at any time during last season. White cloverseed and alsyke being confined to much more limited districts than red, and the weather being particularly unfavourable prior to and at the time of harvesting, are reported to be very deficient, amounting in some districts to almost a total failure; and this is confirmed by the fact that up to this time very few new samples have appeared, although any fine old samples remaining over from last season have lately been readily saleable at an advance of from £30 to £35 per ton.

Trefoil.—This seed being matured much earlier than clovers, and the weather in England at the time it was harvested having been more propitious, a good average crop has been secured, and mostly of fine quality. On the continent it has been quite the reverse, the samples which have reached us presenting a very brown and weathered appearance, and the yield is unfavourably spoken of; consequently the prices of fine English seed, which were very low on the first appearance of the new samples, have advanced up to the present time 5s. to 6s. per cwt.

Linseed.—We have again to report an increasing business in this important branch of the trade of the port. The import into Hull in 1865 exceeded that into any other port in the kingdom, and this year has gone beyond its predecessors; a fact the more striking because the import into London and Liverpool shows a very large deficiency as compared with 1865.

We have received from direct ports.........	552,832 Qrs.
From London and Liverpool	30,000 ,,
Stock last December..	110,000 ,,
Making our supply for 1866	692,832 ,,
Our present stock we estimate at......	120,000 ,,
Actual consumption 1866...............	572,832 ,,
Against do. in 1865...............	615,219 ,,
Being a decrease in consumption of...	42,387 ,,

Import into Grimsby 44,384 qrs., against 42,522 qrs. 1865.

The Baltic has again been the chief source of our supplies. From St. Petersburg we have received 290,745 qrs., the total export from thence being 378,009 qrs. This large quantity of seed has enabled us to supply to some extent the wants of crushers, who have hitherto bought in the London market. We commenced the year with a large stock in merchants' and crushers' hands, but with small supplies afloat, the quotation being 67s. Black Sea, 65s. fine Petersburg. Prices in January were scarcely maintained, there being few buyers in the market, and arrivals pretty liberal. The first week in February brought more inquiry with hardening prices, and the deficient quantity afloat having its prospective influence upon prices, an advance in values was established, which continued without interruption until the end of March, when Black Sea was worth 72s., and fine Petersburg 70s. In April the financial disturbances, coupled with the continental war, began to affect our values in common with all other articles of merchandise; and "casting their shadows before," produced an uncertainty of feeling, terminating in a wise determination in all quarters to contract within the narrowest limits possible all business engagements. Prices gave way, and continued their downward course with one or two slight reactions of 6d. to 1s. per qr. until the middle of October, grounding at 61s. for Black Sea, and 58s. to 59s. finest Petersburg. An improvement set in, the last week of October, gradually enhancing values to the close of the year, our quotations being, as in January last, fine Petersburg 65s., and Black Sea 67s. L.A.T. The stock in all hands is about 120,000 qrs. against 110,000 qrs. last year. Prices are well maintained, the quantity afloat being 150,000 qrs. short of last year, and the stock in London and Liverpool being unusually small. No contract business for next season has yet been concluded. The knowledge of large supplies in the North of Russia, and the expectation of a similar abundance in India, deter the consumers and merchants from granting the rates now asked abroad. The quality of next year's supply will be good, and we look forward to an extensive and remunerative trade.

Linseed Oil.—From the causes alluded to in our remarks on linseed, the price of linseed oil during the year has varied very considerably, and the natural variation has also been much increased by the speculative element, which is connected with the trade, and which unfortunately is increasing. The value of linseed oil ranged as follows, viz.: January 36s. to 39s., February 37s. to 40s. 6d., March 36s. 6d. to 42s.—the highest point reached. A gradual decline took place during the next three months, and in June and July quotations were at their lowest, viz., 33s. 6d. to 36s. 6d. per cwt. With August an improvement took place, and in September the highest value was 41s. 9d., again declining to 37s. per cwt., at which the year closed. Quantity exported 9,328 tons being 9,644 less than in 1865; to London 6,240 tons were forwarded, and New York took from us about 8,000 tons.

Linseed Cakes.—During the past year there have only been the usual fluctuations in the value of this article. The average price has been a high one, caused by the supply of linseed not being adequate to the increasing estimation in which linseed cakes are held by agriculturists. The value of pure cake ranged as under: January £10 15s. to £11 5s. per ton, in February and March £10 12s. 6d. to £11 2s. 6d.; from April to August an advance of 5s. took place; in September £10 to £10 17s. 6d. was the rate; October £9 12s. 6d. to £10 17s. 6d.; and the year closed £11 17s. 6d. to £12 2s. 6d. per ton.

Rapeseed, Rubsen, and their Products.—The import in 1866 was 123,254 qrs., against 45,859 in '65, and 74,330 in '64. The excess of the year's import over that of others has arisen entirely from excellent crops in Germany and Denmark, which as to quality and condition have seldom been excelled. The price at the commencement of the year was nominally 80s. per qr. for German seed, and Black Sea 43s., Calcutta 70s., at which rates one or two cargoes were bought off the coast in January. Further Black Sea arrivals reduced the price to 60s. and 38s. per qr., at which rates they continued till the end of April, when offers of German rubsen were made at 51s. 6d. and 52s. at the port of shipment. With further arrivals from the Black Sea and the Baltic the market was over-supplied, and crushers generally held aloof, looking for lower rates. The lowest transactions were reached in June, when German seed was offered at 47s. 6d. free on board, and Black Sea on the spot 29s. per qr. This led to business, and the new crop being of good quality considerable transactions ensued. Prices advanced during August 10s. per qr., but receded again a little; again advancing towards the end of the year, which closes with steady prices—viz.: Rubsen 60s. to 62s. delivered, and Black Sea to 34s. on the spot and to arrive. The stock in warehouse is larger than usual, being 35,000 qrs. Oil: The year opened with brown at 56s., and pale 58s., which receded to 52s. and 54s. respectively on the appearance of foreign oil in the market. These prices remained with little variation up to April, when they dropped to 44s. and 45s. for foreign brown, and 48s. pale, with a slow trade. A further reduction to 40s. and 43s. took place in June, at about which rates some considerable transactions took place. Prices fell a little towards the end of the year, which closes however with more firmness and a better demand at 40s. to 42s. per cwt. Cakes: During last winter good green cake was very scarce, and held at high prices, say £6 per ton, whilst cake from East India and Black Sea seed was more plentiful, and sold at at about £4 10s. This was the only article of the kind on the market during the spring months, and in April brought £5 per per ton. After the new rape crop made its appearance the market was well stocked with both green and brown, and prices gave way considerably—£4 10s. and £5 being paid for best green, and £4 and £4 5s. for brown. A better demand existed during autumn, and prices rallied, but again fell in October, when considerable transactions took place at £4 12s. 6d. and £4 15s. for green cake. The value at the end of the year was £5 15s. for green, and £4 10s. for brown.

Cotton Seed.—The trade in this article has not been equal in extent to that of last year, the import being 21,380 tons, against 42,034 tons in 1865. These figures confirm the statements made in the early part of the year of the deficiency of the Egyptian cotton crop of 1865, as very little cotton seed is imported from any other country. Some small parcels of Brazilian and Algerian seed have been crushed here; but the results have not been satisfactory to the crusher. A few tons of decorticated cotton seed from the Southern States of

America have also been tried; but the difficulty of refining the oil, and the high price at which the cake must necessarily be sold, have hitherto prevented the extension of this trade. These difficulties will doubtless be overcome ere long, and cotton seed (like linseed) will be sent to this country from whatever part of the world it may be produced, more particularly as the price obtained for it at the place of production is so much clear gain to the grower, cost of freight and difficulty of transit being the only barriers to an immense importation. The year opened with a very small stock of old seed, which realized £8 15s. Prices fell during the month of January to £8; but the first cargo of new seed arriving in the end of the month was readily placed at £8 15s. During the month of February further arrivals of both old and new seed brought the prices down to £7 and £8 respectively. March was marked by more disposition to purchase, and, in consequence, an advance of 10s. to 12s. 6d. per ton was realized; but the relative difference in price between new and old seed was not maintained, crushers finding by experience that good old seed of the crop of 1864 yielded nearly as much oil as the new seed of the crop of 1865. Large arrivals of seed during April caused a rapid fall to £7 10s. per ton, which was about the nominal price up to the middle of August, importers generally landing rather then accept less money, although exceptional transactions took place during the panic at £7, and even under. The improved state of trade, consequent upon the reduction of the Bank rate of discount in August, had its effect upon cotton seed, being followed by an advance of 20s. per ton by the end of October. In November the deficient import began to be felt, and prices advanced rapidly from £8 10s. to £9 10s., followed by a further upward movement in December to £10 per ton, at which figure the year closes, with an almost entire absence of stock. These high prices are, however, maintained solely by scarcity, and as they leave no margin, but an absolute loss to the crusher, they must necessarily fall when large arrivals take place. The shipments from Alexandria during November and December have been small: the supply will, therefore, be very limited during the first two months of the year. The Egyptian cotton crop of 1866 is, however, believed to be large, although it will probably not equal that of 1864.

Cotton Seed Oil.—A large proportion of the seed having arrived in a heated state, the oil was considerably injured for refining, making so great a per-centage of waste as to leave no profit. The immense quantity of rape oil has also interfered very materially with the use of cotton oil, and has assisted to make the year 1866 a very unsatisfactory one for cotton oil refiners; the business, consequently, has been limited in extent. The year commenced with crude at 33s. 6d. naked, and refined at 40s. 6d. in casks. Prices fell during January in sympathy with seed, reaching 30s. 6d and 37s. 6d. respectively by the middle of February; a slight advance then took place to 32s. and 39s., from which prices a continuous and almost weekly fall resulted in quotations of 24s. 6d. and 31s. 6d. in the end of June. During the month of July crude rallied a little, and touched 25s. 6d.; but refined, influenced by speculators' resales and bear sales from London, was very much depressed, and sales were made in some instances as low as 30s. to 30s. 6d. in casks. August was distinguished by a rapid advance up to 30s. and 31s. for crude, and 37s. to 38s. for refined. These prices ruled with but little variation, and with very little business passing, till the early part of December, when the absence of demand for refined oil and dulness in other oils brought prices down to 29s. naked for crude, and 36s. 6d. to 37s. for refined, at which figures the year closes. Some little crude oil is in crushers' hands; but refiners, discouraged by the unprofitable character of the trade, will not open their refineries at the present difference between crude and refined.

Cotton Seed Cakes.—In the early months of the year the trade was depressed by speculators forcing their contract cakes on the market; during the spring and summer the demand was very limited; during the autumn the large production of rape and Rübsen cakes checked the consumption; but in the months of November and December all the cakes offering have been eagerly bought up at very high prices. The price at the commencement of the year was £5 5s., which gradually fell to £4 10s. by the end of February. In the early part of March a large demand sent the price up, and by the middle of the month the quotation was again £5 5s. During the month of April the large supply of seed and approach of summer brought prices down to £4 5s., the lowest point of the year. This low price induced speculators to come forward, and the quotation rallied to £4 10s., which was about the value till the middle of August, when an increased demand made the price £5, which was the ruling figure till the end of October, when £5 5s. was freely paid. During November and December absolute scarcity drove prices up to £6, and thence to £6 10s., which is the present value, with scarcely any stock for sale.

Olive Oil.—The imports this year, consisting principally of Gallipoli and Neapolitan, have been 6,945 tons against 7,555 in 1865, 5,195 in '64, 5,177 in '63, and 7,454 in '62. Prices have ruled very steady during the year, Gallipoli from about £58 to £61 and £62. The consumption also has gone on very steadily, notwithstanding the advance of prices, consequent upon the unfavourable reports of the crop abroad. Stock 193 tuns against 400 tuns in '65, and 569 in '64.

Flax.—The import for the year is 10,306 tons against 13,720 in 1865. The very high prices ruling in the foreign markets during the whole of the year left so small a margin for profit that our merchants have imported less than usual, and there have been fewer consignments. The quality of the flax has not been so good as that of the previous year, and the trade this year has not been so satisfactory as might be desired. Prices opened very firm in January, with a fair demand, Portuguese F.P.K. being worth £62 per ton. Small stocks and advancing rates abroad caused a speedy advance to £69 to £70, at which price this mark remained until the middle of February; the demand, however, at this extreme point, being considerably curtailed. Prices remained nominally firm to the end of March; but to effect business concessions had to be made, and these small concessions in price characterised the remainder of the year, our closing quotation for Portuguse F.P.K., being £61 to £62 per ton.

The import of Tow has been 4,209 tons against 7,104 tons in the previous year.

Hemp.—The total import for 1866 amounted to 5,075 tons, viz., 2,257 Petersburg, 2,837 Riga, and 11 tons sundries. The year opened with the price of clean at £36 per ton, receding by the end of June to £33. The inferior quality of the new arrivals in July and August caused a further decline of £2 and £3 per ton, with the exception of prime parcels of 1864, which were readily saleable at £2 per ton above the current rates. We opened the New Year with a slack trade—although the light stocks here and elsewhere, with an apparent tendency to some improvement in the demand, will probably fully maintain present prices until the new import takes place.

Cattle Bones.—The total import is about 3,000 tons in excess of 1865, and in consequence of the liberal supplies prices have ruled from 10s. to 15s. per ton in favour of buyers. The stock is about 1,000 tons, including 80 tons of bone ash, against 500 tons last year. Price at present is about 5 gs. to £5 7s. 6d. per ton, with but a small demand.

Guano.—The supplies of Peruvian into this port have been less liberal than last year, say 9,115 tons, and the demand is on the increase.

Tar.—From Finland and Swedish ports the import this year has been 24,992 barrels against 26,054 ditto last year. During the spring months prices ranged from 16s. to 16s. 6d. As the year advanced, however, prices gradually drooped. Some early arrivals this season altered the price to 14s., and later on, a still further downward tendency was shown, and lower figures submitted to. The market is, however, firmer, and 14s. to 14s. 6d. the nearest value. The present stock in all hands is about 7,000 barrels, against 6,500 barrels last year. Archangel: The import into Hull is still very small, there only being one arrival of 1,192 barrels. A reduction in its value of about 7s. per barrel compared with last season will, however, cause increased consumption, and larger imports may be encouraged. 15s. to 15s. 6d. is the nearest value.

Turpentine Spirits.—Our market is still well supplied, principally with French from Bordeaux. The import direct from foreign ports during the year is near 400 tons. Prices have fluctuated from 44s. to 48s. early in the year. Increased supplies of American spirits into England later on caused unsettled prices. French is now worth 37s. to 37s. 6d., and American 38s. to 38s. 6d. Crude Turpentine: No direct imports worth notice.

Rosin.—Our market continues to be abundantly supplied, mostly from Bordeaux. Increased imports into England from

American ports has caused much lower prices to be accepted, especially for the finer kinds suitable for soap making, and for which qualities the French makers bid fair to outrival the American. The finest soapers' rosins are worth from 14s. 6d. to 18s. ; medium amber, 11s. 6d. to 12s. 6d., and common kinds for distilling, 9s. 6d. to 10s. 6d.

The abolition of all duty on WOOD GOODS, in March last, to which may be added the low rate of freight from the Baltic ports, gave great encouragement to the importation of low and inferior qualities of deals and boards of every variety of dimensions ; a class of goods never before imported, and which, but for the very low cost, would not have found buyers. It is now difficult to say the purposes to which some of them are to be applied. The above cause, added to the effect of a high rate of discount during the summer, led to a general depression of prices, and a somewhat sudden curtailment of the American shipments. The stocks in hand are estimated to be somewhat less than they were on the 1st of January last, while the importation has been somewhat more in 1866 than in the previous year. The present low rate of interest, with the abundance of unemployed capital, combined with the increasing confidence, will, it is hoped, lead to a speedy revival of the timber trade from the depression which it has recently suffered, and make the coming year one of greater prosperity than the last. The import of sawn wood in 1865 was 203,578 loads ; 1866, 218,753. Hewn wood, 1865, 55,706 loads; in 1866, 51,467. Total, in 1865, 259,284; in 1866, 270,220 loads.

COALS.—The export trade this year is 168,764 tons, against 190,734 tons in '65. Although the exports may not keep pace with neighbouring ports, still the annual consumption by our large steam trade causes the demand to be quite equal to the supply. Prices are on the advance, and likely to continue. Coal at the pit mouth is fully 1s. to 1s. 6d. per ton dearer, and the carriage by water is 6d. per ton higher than for an average of years ; and this, to all appearance, is likely to increase. An advance of 6d. per ton is at present in agitation by the different railway companies on all minerals. Also, the colliers work so restrictedly, that not two-thirds of the quantity is got. The average time of labour of a hewer or collier in the South Yorkshire district is now reduced to about 32 hours per week. This accounts for the short supply of coals, and materially checks our export trade.

SHIPPING.—American freights have been very much depressed this year, ruling about 28s. timber, 80s. to 82s. 6d. dry deals from Quebec to Hull and Grimsby, 80s. Saguenay. From the lower ports next to nothing has been done on this side, as tonnage always offered plentifully on the spot at very low rates. Erom the Baltic a better business was done at the commencement of the season. Freights from Cronstadt to Hull or Grimsby opened at 46s. 3d. deals, and advanced to 50s. ; but declined to 47s. 6d. again for the second voyage, and closed at 40s. Wyburg to Hull 55s., Grimsby 52s. 6d., West Hartlepool 47s. 6d. to 50s. was first paid, but these freights also gave way, and finally business was done as low as 42s. 6d. Fredricksham to West Hartlepool. Gefle to West Hartlepool was done at 45s. and 43s. 6d., Hull 45s., Liverpool 68s. ; Bjorneborg 52s. 6d., and 50s. Hull ; Monksound 57s. 6d. ; Narva and West Hartlepool 55s., Riga 48s. ; Gothenburg and Hull, 30s. ; Archangel and Hull, 4s. 9d. seed. Freights for steamers in the Cronstadt trade ruled low, not at any time reaching the rates current at the best times of preceding years by 1s. 6d. and 2s. per qr. From the Prussian grain ports trade was also very dull until late in the season, when a demand sprung up at 4s. to 4s. 6d. per qr. wheat, Hull ; 5s. London ; 5s. 6d. to 5s. 9d. Antwerp ; 6s. Rotterdam.

P. BRUCE.

Hull, Jan. 3.

THE PRICE OF BARLEY UPON THE REPEAL OF THE MALT-TAX.

Who can answer the question ? Will repeal raise the price of barley ? Will it make less distinction between the price of best barley and medium quality barleys ? Will the growth of barley be greatly increased thereby ? Will the price of beer be much lowered ? Will the number of common brewers be much augmented ? Will private brewing become general ? Will the beer itself be greatly improved ? Will maltsters derive much benefit by the repeal ? Will private malting be much adopted and practised ? What advantage will be derived by the public from repeal ? It is a far easier thing to ask questions than to answer them, particularly in a satisfactory and intelligent manner. However, I am so satisfied that the bulk of the community seldom inquire into the precise nature or practical working of any measure, that I am induced to offer, in my plain way, some observations and speculations upon the probable effect upon the growth of barley and the brewing trade by a total repeal of the malt-tax.

Let us take a few plain facts to begin with. Take the total quantity of malt used in brewing to be nearly 5,000,000 quarters : upwards of four-and-a-quarter millions are used by common brewers. It is said, and we may affirm it without much hazard of contradiction, that any one of the three largest brewing establishments in the metropolis requires annually for their own separate uses more than all the eastern counties put together can produce ; and one of them, it is further said, would require nearly all Lincolnshire to help out. Can this be right ? Does not this show a monstrous monopoly, and that it requires great capital to pay the malt-tax—*i. e.*, to be a brewer ? Small capitalists seldom do well in the brewing trade. Take the enormously-large Burton brewers : what capital is there involved ! and many instances elsewhere are found of like extensive establishments, all tending to prove that brewing is a great monopoly, a prejudicial monopoly, created in a high degree by the heavy outlay requisite to keep up a supply of malt. Maltsters are in a precisely similar position as respects capital. They have the first demand to meet, the tax to pay. Take off the tax, destroy the monopoly, and malting and brewing would become almost universal—at least, in country districts. The processes might not be so cleverly accomplished, but maltsters' and brewers' profits would be for the most part saved, and a more wholesome drink would no doubt be produced. I take these to be facts.

But to my questions. Will the repeal cause a rise in the price of barley ? I venture the assertion that it will, and more particularly inferior barleys, and, as a natural consequence, other barleys would derive a similar advantage too. And why should it not ? Barley is, and will be, chiefly grown for brewing, although in part for distilling purposes. This I venture to assert also, because, as feeding stuff for stock, it can easily be supplanted by foreign importations, and by the more general use of Indian corn and other cheap grain, which is already largely in consumption. It is always vauntingly put—You can never expect the price of barley to equal the price of wheat ! But I say, *Indeed I do ;* why should it not ? I will also reply, You never expect to brew such good beer from malted wheat as from malted barley. Wheat is used mainly, and rightly, for human food ; barley —*i. e.* malted barley—is and will be chiefly applied in the provision for human drink. Only take off all restrictions and imposts, and see if it won't go ahead. Good beer is in reality far more valuable than champagne or like similar drinks ; iron is more beneficially useful than gold. The consumption of beer, particularly of home-brewed beer, would be enormously increased. It is the adopted beverage of every class, and it is only the poorer part of the population that are debarred its free use. The inferior barleys would come into general use for the general public, and therefore be in greater demand for malting and brewing, as, not having any tax to pay, they would be malted, and the first and highest-class barleys would, I anticipate and verily believe, reach fabulous prices? And why? Because the trade in brewing will undergo a great change and a thorough revolution. Our monopolizing brewers will find their trade for common ales wonderfully fall off, from the increase of small breweries and the love of home-brewed. Hence they will turn their principal attention to the production of fine ales, ales of splendid quality, so fine as were never before produced, and such as are even well calculated to supersede our cheap foreign wines. For this, malt of most beautiful quality and colour must be forthcoming, and must be provided, to achieve this most needful desideratum. Price will be of no object or account; it must be had. Growers, knowing this, will redouble their efforts to obtain the finest varieties or sorts of barley, and to produce their crops of a quality to meet such demands.

Will it make less distinction between the price of best barleys and medium quality barleys? My opinion is that it will make a wider distinction than now exists. Inferior or medium quality barleys will undoubtedly improve in demand and price, owing to the increase of minor brewing establishments and private ("home") breweries. But the barleys of finest quality and beauty of colour will quite exceed in price every estimate hitherto formed of their ultimate value; as I have said, I believe they will realize fabulous prices, hence the greater distinction between the two.

Will the growth of barley be greatly increased thereby? Unquestionably it will. If a great extension in brewing is to take place—as undoubtedly it will—the demand for malt must be met. But that is not the chief point; it is that a vast increase in the consumption of beer will arise, and will require both inferior and best barleys to provide for it.

Will the price of beer be much lowered? I think by no means to the extent supposed; but common ales will be reduced to the full extent of the reduction of the tax, and probably further by unrestricted trade in brewing, and the use of inferior qualities of malt from inferior barleys.

Will the number of common brewers be greatly augmented? As the malt-tax locks up some £6,000,000 of capital, much of which brewers might employ, it is reasonable to suppose that if this sum were remitted very many small capitalists would take advantage of it and commence the business of common brewers.

Will private brewing become general? It would become pretty general in all country districts where families possess requisite facilities, but not in towns. The knowledge that householders can make and use their own malt would aid much in promoting this.

Will the beverage itself be greatly improved? Certainly; the temptation to adulteration will not be so great, and the common run of ales would be brewed after a higher standard than now—*i. e.*, more malt to the barrel. The very finest and best ales would be subject to a laudable rivalry amongst brewers and be greatly extended, which would lead to their improvement too.

Will maltsters derive much benefit from the repeal? Undoubtedly they will. The capital of £6,000,000 now paid as the tax is divided between the brewer and maltster; but the maltster has to make the first payment, requiring thus about one-third more of original capital to carry on his business. Upon the sale of malt this is returned to him by the brewer; both, of course, upon the repeal, would be benefited by being enabled to carry on their business with that amount less of capital; besides, there would be more barley to malt.

Will private malting be much adopted and practised? I believe it will; but I doubt the policy of so doing. Malting is a specific business, requiring great care, knowledge of the process, and judgment. It is, and can be, done with much greater accuracy and advantage to the barley malted by the maltster than can be accomplished by private means. True, farmers and others may steep their barleys and grow them, but facilities for drying are seldom at hand. Probably hop-growers may advantageously do this in their hop-oasts. Illicit distillers amongst the Irish mountains steep in the lakes and dry in the sun. It may, therefore, be done if farmers will do it; the question is as to the best course. Wetted and grown barleys in bad harvests may be profitably dried for brewing, but good barleys should go to the maltsters.'

What advantages will the public derive from its repeal? This is the main question, and requires careful examination. The public must find a substitute. The tax or the amount derived from it cannot be spared. Beer I take to be one of the necessaries of life to the inhabitants of Great Britain. It comes into every day's consumption, after the same order as tea, coffee, cocoa, sugar, &c., and ought to be taken as a beverage or superior drink to these, and not as a luxury; it ought, therefore, to be as free from taxation as any of these, or lowered in proportion at least. All necessaries of life ought to be free from taxation; all luxuries and unnecessary aids to higher life, or additional style and ornamentation of life and comfort, should bear taxation instead; but not all these. There are innumerable accessories to our family comforts, and necessary to different styles of life, that derive all their value by being adopted and purchased by the upper ranks of society; thus are our trades and manufactures supported. To tax these various articles and fabrics of manufacture would be to tax native industry—a truly great folly. But there are many things of almost universal consumption which are not absolutely necessary to any condition of life, and which do not enter largely into industrial employment, *i. e.*, wines, spirits, tobacco, fruit, and indeed whatever may be deemed a positive luxury and not requiring great labour in the production; these ought to bear the chief burden of taxation in an advanced state of society in any country: it is upon these luxuries or common indulgences that taxation should be heavy, to the relief of the requisite and necessary. The common people, whose means are scanty, ought not to be taxed, or but lightly: they are mainly *the British public*, and at present paying a large amount of taxation, *i. e.* in tea, sugar, tobacco, and *beer*. If the tax on malt or beer were repealed, this class could not fail to be benefited, as I have shown already; besides, what a large amount of labour is paid in beer! every working-man calculates so much money and so much beer in his daily wages; any reduction in the price of beer must therefore be a boon both to employer and workman. I say, then, that the public would be greatly advantaged. But the malt-tax cannot be spared; well, let it be put upon the same footing as tea, coffee, cocoa, and sugar, according to value; or, what would be far better, put the chief tax upon those almost unnecessary articles wine, spirits, tobacco, fruit, &c., and let the working population go as free as possible. The partial tax upon beer would be a great relief from the present oppressive import. It would set the trade in malt free—it would extend and increase the trade of brewing—it would cause a great extension of private brewing—it would require less capital. The common brewer paying no tax upon malt would only be called upon to pay tax upon beer as he brewed it. The private brewer would only be called upon to take out a licence for brewing according to the extent of his requirements.

P. F.

THE LEICESTERSHIRE CHAMBER OF AGRICULTURE.

The inaugural dinner took place at the Bull Hotel, Leicester, on Saturday, January 5, under the presidency of the Duke of Rutland, the lord lieutenant of the county, who was supported by over 100 members and visitors.

The Noble **Chairman**, said that he had received letters of apology for non-attendance from Mr. Packe, M.P., who was of opinion that such associations were established 20 years too late, that it was high time the farmers had been aroused to a sense of the mischiefs of modern legislation since the establishment of free trade. It was an undeniable fact that the position of the British farmer had not had a fair share of the consideration of Parliament. Too much attention had been paid to the British manufacturer in competing with foreign countries; and when farmers had met for the purpose of complaining of a grievance, they had been met with the cry of "No politics." It was an insult to common sense that where the pocket suffered the cause of it should not be probed to the bottom by discussion. The Chairman thought he might sit down by saying that he fully endorsed the sentiment. After apologising for the absence of his brother, Lord John Manners, who regretted that he was unable to be there, as he left him in bed with an attack of illness which had prevented his attendance at the Cabinet meeting on Thursday, he said their object was to bring before the Legislature any grievance that they thought they laboured under, and to induce the Houses of Parliament to consider and respect their rights and redress their grievances. They thought that of late years the weight that was due to agriculturists, the largeness of their body, and their wealth, had not been duly attended to in the Legislature; and it was for the purpose of bringing to bear upon the Legislature their wishes, feelings, and grievances that the Chamber was established. He believed they would agree with him that, for the useful and profitable working of the Chamber, it was important that party politics should be excluded, but only party politics. They might consider any question, whether the malt-tax, the toll-bars, or anything else coming under the term of politics, but nothing relating to party. They cared not for the politics of any man so long as he gave them his vote in the House. It was right also that all internal jealousies should be done away with, and, if they meant the chamber to be useful, they, must lay aside all small prejudices, so that landlord and tenant foreman and labourer, might unite in supporting it. He would not touch upon the various questions to be brought before the Central Chamber, much less would he venture into the question of the malt-tax, or the toll-bars, for their great object was to put a stop to injustice. Therefore he hoped he should not be considered to be bringing forward a question that was altogether irrelevant to the object of their meeting if he ventured to refer to a subject that was mentioned the other day by the great agitator of the day, Mr. Bright. In order that he should not misrepresent the honourable gentleman, he would quote the whole of the paragraph which he had copied from the papers. On the 5th of last December Mr. Bright, in a speech, said: "Again, in 1846, although every intelligent man in every country in the world admitted the justice and the force of our argument against the corn laws, still it required the occurrence of a crushing famine in Ireland—a famine which destroyed as many lives in that country as would have been destroyed by a great war, and which drove into exile as many of the people of that island as would have been driven into exile by the most cruel and relentless conquest—it required all that, before the Parliament of England, the men among whom I sat, among whom I sit now, whose faces are as familiar to me as those of any person whom I have known in life—I say it required all that, before they would consent to give up that intolerable wrong, and cease to tax the bread of an industrious community." Now, if he was alone concerned in the paragraph, he should sit down; but there were those alluded to in it who were now no more, who had been called away, and whose characters were reflected upon. He was glad of the opportunity of vindicating the memory of as great, as patriotic, as honest, and as straightforward politicians as the country had produced. There was no doubt those sentences were uttered in order to prejudice the people against what he might call the governing party; but in point of fact, it really did not touch them; and if referred to anybody, it was to the late Sir Robert Peel, and to Mr. Bright's friend, Mr. Gladstone, and to no one else. Who was it that gave up the contest for Protection on the grounds of the Irish famine, but Sir Robert Peel and his followers? He believed, nevertheless, that they were actuated by pure and patriotic principles, but that they had conscientiously changed their opinions. But when the Irish famine and the lives of the Irish people were laid at the doors of those who to the last defended the protection which they believed to be the best for their country, he repudiated any such imputation. He said that not so much on his own behalf as on the behalf of Lord George Bentinck, than whom there was not a more noble or more conscientious man. Why did he adopt the course he pursued at the time of the Irish famine? Why, because—whether rightly or wrongly, he would not say—he conscientiously thought that the famine was to be met by other and different means than by the repeal of the corn laws. He thought it not a question of food; but that it was a question of bringing the food to the mouths of the people. He thought what they wanted was the money wherewith to buy the food, and he proposed that the people should be found employment, and he therefore proposed a vast scheme of Irish railways; and who could tell, if Lord George Bentinck's proposition had been carried out, it would not have been successful, or that the Irish famine might not have been mitigated; and who could tell, if he had been successful, that the emigration which followed would never have taken place, and that Fenianism, of which we heard lately had so much, would never have been heard of? Now, he gave Mr. Bright credit for conscientious motives; but he said this, that a politician who could take so low a view of his fellow-labourers—who could believe not one, two, or three men, but that a large body of English gentlemen could be so actuated by selfish and unpatriotic motives—that the man who really believed that (and if he did not believe it he would not say what he thought of him), and took such a low view of his fellow-countrymen as that, had not those great, those ennobling, and those judicious qualities of which our statesmen and our patriots are made.

Lord **Berners** gave the toast of "The Central Chamber of Agriculture." In doing so, he said such societies were meant to bring in the strongest bond of union the landlord and tenant farmers and their workpeople. Such was necessary, because the landed interest had not received from the Legislature that justice which they ought to have received on many occasions. To show the necessity of such, and that a proper stand should be taken in Parliament when any agricultural measure was brought before it, he would state that as far back as thirty years ago, whenever anything occurred to affect the landed interest, it failed for want of co-operation. Mr. Huskisson, when he first tampered with the fiscal regulations connected with agriculture, by taking off the tax upon hemp and flax, which were produced by the farmer, increased the tax upon oilcake, clover, and other grass-seeds. When a remonstrance was made, they were met by the cry that it was too late. A similar society to that was established in 1835, in consequence ot politics being entirely excluded from the agricultural associations; and, with the aid of the central and sixty-seven local societies, exertions and petitions were sent to the King; and, the next session, the claims of the agriculturists were acknowledged in the speech from the throne, and redress promised to their grievances. Soon after, the society failed, in consequence of the indiscretion of one or two of its members; but, in 1846, a special committee of the House of Lords sat, and took evidence, which resulted in the redress of the grievances. One great injustice at the present time was the inequality of the rating of the country, a question which the whole of those connected with the land should look well into. The total sum received per year was something like £9,680,000, and the expenses for the administration of the poor-law only £6,423,000, the other charge amounting to very nearly £3,000,000, which charges were quite distinct from relief of the poor. Why was the expense of registration, vaccination, &c., which amounted to about £173,108, thrust upon the land? When the question was asked in the House of Commons, the Chancellor of the Exchequer replied, because there was no other class that would like to bear it; they did not know where to put it. It was wrong that one-third of the whole of the poor rates should be spent in four or five items unconnected with the relief of the poor, which was equal to 23 per cent. of the income tax.

Mr. A. **Pell**, chairman of the Central Chamber, said the society was established on the principle of the chambers of commerce at Manchester and Liverpool, which meddled in politics, the former sufficiently to make them feel it with effect, it having boasted that it associated itself with those measures which led to the final repeal of the corn-laws. It was therefore the farmers' business to take care of themselves, and he repudiated asssertions that it was a Radical or Conservative movement. They desired to elevate the labourer, and it was monstrous to blame the farmers for the present condition of their servants while such small profit could be derived from the land. It was a great injustice to put a tax upon that which was the very life-blood of the labourer on a harvest-day.

"The Borough and County Members" having been given, Lord Curzon and Mr. Hartopp, two of the county representatives, responded, expressing their approval of the organization of such an association, and the latter hoping for a removal of the obnoxious malt tax. If they did not get it removed in the next session, they would not in the following; for their efforts would be frustrated by the wild schemes of some persons who would convert our time-tried constitutional monarchy into a miserable republic. He was convinced that whatever reform the English people required ought to be carried out in such a spirit has to consolidate our constitution.

The toast of "The Town and Trade of Leicester" having been drunk, Mr. T. Willson (the secretary) gave "The Visitors," which was responded to by Viscount Ingestre.

Mr. C. S. **Read**, M.P. for East Norfolk, referred to the malt-tax, which he hoped to see abolished. It was said that in Norfolk they were protected by the malt-tax; but if protection were tying the leg of a man when running a race, he would rather be without it. In Norfolk they were not benefited as much as the farmers in Leicestershire. The only persons really benefited were the brewers, and not the farmers. As to the question of labour, any burden that fell upon the land must eventually be felt by the landlord. If a police-rate were increased 0½d. or a county-rate 1d., that fell upon the tenant entirely; but when they came to an important question like labour, if it were a case of 25 or 30 per cent., it was impossible for the tenant to bear the brunt, and therefore it must affect the landlord. And there was no co-operative labour unless a landlord was a party to it. If they were to have co-operation, let the landlord take three-fourths of his rent, let the tenant take another portion, and the remainder be equally divided between the tenant and labourer. He should be glad if the settlement laws were entirely abolished, and when the labourer was set entirely free he would feel the benefits of recent legislation and be independent. Farmers were in a different position from a manufacturer who was not aware of the number he employed; but they did know whom they had engaged on their land, and they had many means of helping a poor man and his family, which he hoped they would carry out. It was not by actual money payment that they could do the labourer service. They could often call the attention of the landlord to his position; they could give him garden ground, cart his coals and his wood, and he was sure that the comforts of a farm kitchen would be much enhanced by a just distribution of the refuse of their dairies, &c., to those who needed it. So deeply did he feel the responsibility of a tenant farmer that he said, if at the close of each day they did not feel a happy conviction that they had done something to make those about them happier, they had not done their duty in that state of life in which it had pleased Providence to place them.

THE GIFT OF A LABOURER'S CLUB-ROOM.

On Friday evening, the 28th of December, a meeting was held at Bardwell, Norfolk, for the purpose of accepting the offer of a new Reading-room for the labourers of the parish, made by Mr. G. Kersey Cooper, of Euston. It is a handsome edifice of red brick and flint, 30ft. in length and 15ft. in width, fitted up with tables and seats on the Windsor model, sufficient for 50 men, with accommodation for more, if necessary. A small room leads out of it, for providing coffee at a halfpenny a-cup. The weekly subscription is a penny, and draught-boards and dominoes are provided also, besides a good supply of newspapers and periodicals. The whole has been provided by the founder at a cost of £200, and made a free gift by him to the poorer inhabitants of the parish, where he holds a large occupation. The principal occupiers and others were present on the occasion, with a large number of labouring men and lads.

The rev. A. P. **Dunlap**, being called to the chair, said: The name of Mr. Kersey Cooper was well known to them all for many previous instances of judicious and well-timed benevolence; and now, to his other acts of kindness and consideration for their welfare, he had added this one, which he had designed for the improvement and recreation of their leisure hours, after their return from their daily labour, and when they most needed refreshment and repose. He did not (as he understood his feelings) mean it as antagonistic to any other interest or attraction, if they preferred such. He did not wish to interfere with their movements after their work was done, which were entirely then at their own disposal; he only wished to set before them one other attraction, which offered them "innocent" amusement, (a name well suited to that day on which they were met together) which offered them wholesome food for their minds, and a pleasure which brought no sorrow. For himself he, as rector of the parish, begged to tender his warmest thanks to Mr. Cooper for this boon to his poorer parishioners, and sincerely trusted that they would receive it in a right spirit, and show their gratitude to him by availing themselves of it, as he so earnestly desired; and while grateful to him for such an expression of his feeling and sympathy with them, they would be thankful above all to that Almighty Being who could alone put thoughts of kindness into the heart of man, and alone bless his feeble efforts for their present and future good.

Mr. **Cooper**, on rising, said: I can assure you, my friends, it affords me very great pleasure to meet you here this evening, and offer for your acceptance the use of this room for your social comfort and improvement. I have long felt that the working man is a social creature, and feels the same pleasures in the interchange of thought as those in higher classes enjoy; but when the toils of his day are ended, and his supper is over, he is often unable, from the limited size of his cottage, and the domestic duties of his family taking up all the vacant space, to ask a friend or two in to spend a few hours with him. I hope, therefore, that this building will give you the opportunity of doing so, and in part meet what you need; and it will be the endeavour of myself and my friends to minister to your entertainment and improvement in it by a supply of such papers and periodicals as will amuse and instruct you, and enable you thus from time to time to know more of what is passing in the age in which you live. My great desire is to see the working classes elevated in their tastes and habits, and feel a higher respect for themselves; for without this, they will not obtain the respect of others; but the more they do this, the more likely are they to become not only better but happier men. I sincerely trust that this little offering of mine will help them to become so. The rules have been framed for the regulation of it with much consideration and care, and I can only say, in conclusion, that I shall be more than repaid if I find that you take advantage of it and become members of it, and that it ministers in some degree to your comfort and instruction, or furthers in any way your best interests here.

Mr. **Greene**, M.P. for Bury St. Edmund's, said: I feel sure that I am speaking the feelings of Mr. Cooper when I say he does not offer you this reading-room as an act of charity, but as a testimony of his good-will to the working men, and a desire to fulfil his duty as an employer, and one to whom God has given the power. He desires to give the labouring men of Bardwell an opportunity of enjoying themselves in a pleasant and rational manner, and improving their minds after the hard labours of the day are done. I join most heartily in this good intention of his, and I trust it may be known far and wide, and lead others to go and do likewise. It is a need greatly felt in country parishes, which he thus endeavours to supply, for I fully agree with him, my labouring friends, that you need the relaxation of meeting one another in social intercourse, which you are not able to do at your own homes. It will be a boon to you indeed, if you embrace the opportunity now offered you, as you must remember you have minds to be cultivated; and although hard work is a necessary part of all our lives, still God has given us a higher nature to improve, and if we only eat, drink, sleep, and work, we are leaving in a barren state that which will give us the greatest enjoyment. Your friend, Mr. Cooper, has rightly said, if a man wishes to be respected he must respect himself; you may rest assured this is true. Much has been said of late by political agitators to make the working man think the laws of his country prevent him from rising in the world; this is untrue, and mere political claptrap. There is no royal road to prosperity and happiness, but by fulfilling the duties of our stations, honestly and industriously, whatever our position may be. The success of every man in life, under God's blessing, is in his own hands, by taking advantage of his opportunities. My friend Mr. Cooper now gives every man, however humble his station here, an opportunity of fitting himself to rise in the world, or at least of better filling his place in it. I trust it may be so; that it may be the beginning of a new era in this parish of Bardwell, and that you will find in this comfortable room, with its bright lights and warm fire, a constant source of quiet enjoyment in friendly intercourse with each other, and in self-improvement too.

Mr. **Herman Biddell** said, My idea is this: After a labouring man has done his work for the day, and eaten his evening meal, there comes an hour between then and bed-time, which, as some at least are situated, is not always comfortably passed by the family fireside. More especially does this apply in the case of some I see before me—lads from 16 to 20 years of age, who, not having a household of their own, are old enough to feel the inconvenience of an over-crowded room at home. It may be the little folks of the family become noisy and troublesome; and if the mother take in washing perchance the room is full of reeking linen, and it may be that the night is wet, in which case the only alternative is the public-house, where I have no doubt many in this room are occasionally to be found. I don't wonder at it. I am inclined to think if I were similarly placed I should go myself, but mark what I am about to say on this point. I have no fault to find with a man because he occasionally goes to the beer-shop to get what he can't find at home, but of this I am perfectly certain—that there's no man, either old or young, who makes a resort to the beer-house his constant habit—who always goes and always drinks—I don't care who he is, or what he may be, there's not a man who if whenever he has a sixpence to spend or an hour to spare regularly goes to the public-house, but who sooner or later drinks to excess. What that leads to is pretty well known. Some of you, for aught I know, may have the habit. Your home may be uncomfortable; and the beer-shop has its attractions, and hitherto, as I said before, may have been your only alternative; but remember, with you at least, the case is altered now. Here is a room, comfortable, warm, and well lighted, and at the same time almost free of expense. It is not in every place that there is one with the means to do for its poorer classes what has here been done for you; and more seldom still with the will to use for such a purpose the means which are at command. By this I don't mean to say that it is incumbent on every one in your friend's position to do as he has done, although I earnestly hope his example may be followed in other parishes; but you must bear in mind he has done his part—now, do yours; show that you appreciate what he has done for you by taking advantage of the opportunity offered. I am not speaking to you as one unacquainted with the class to which you belong. I have been associated with the agricultural labourer all my life, and know how much you have to contend with, and how like mockery it seems to be told to better your condition, to raise yourselves in the scale of society, without pointing out the means by which it is to be done, and without considering the little your all is composed of. Don't think because you are recommended to take pleasure in pursuits hitherto regarded as belonging to another class that your position, your means, your circumstances are overlooked; nor imagine that while you are invited to try the enjoyment of reading and harmless social intercourse your daily occupation is held up to you as a degradation, or your means of livelihood no longer as an employment of honourable respect. Far from it. There may be as much true honour in the man who holds the plough as there is on the head of the greatest of the land; and be your daily labour but to feed the ox or tend the herd, there is as much respect due to you, if your duty be but honestly performed, as belongs to the duties of the Prime Minister of England. Each of us has undoubtedly a mission in life, but it is not so much what that mission is as how that mission is performed. And now let me say one word to the young men who are here to-night. I understand that your club-room table will be supplied with periodicals, papers, and magazines. Now, I dare say, there are not many of you who are in the habit of reading the public papers; but let me tell you there is a fund of amusement as well as instruction in these things you are little aware of; and provided the magazines and papers you read are conducted on conscientious respectable principles you will have no cause to regret the time when you first took to reading them. You may have the idea in your heads that such amusements are only for the upper classes, for those who have money and time and education, and for them only. No such thing. Who knows what learning to read may lead to? George Stephenson, the great engineer, who may be said to have instituted the railroad system of this country, was at first but a labouring man in a mine; and did time permit I could point to numerous examples where men by their own exertions have risen to eminence only by cultivating their natural talent by education, and who, I would remark, had no advantages peculiar to themselves: the great secret of their success in life being that they made the most of what they had, and that, recollect, is what every man in this room can always do. I do not mention these things to impress you with ideas you can never carry out, nor to foster visions of ambition which should make you look upon the occupation of the labouring man as a degrading means of earning a living, but to impress upon you the fact that all depends upon the individual himself, and not on the advantages that individual possesses. In conclusion I have one word of advice to offer. It may be in the social meetings, many of which I hope you are destined to have, that you may discuss subjects upon which you are not all of a mind. Let me caution you one and all to receive with respect the opinion of those who may happen to differ from your own. Recollect every one has a right to his own opinion, and be he young or old, simple or gentle, you are bound to receive with respect the judgment of all those with whom you are brought in contact; and though you may differ in your views, to differ always with temper and moderation.

Already fifty-eight labouring men and lads have entered their names as members, while their regular attendance, even in the late inclement weather, proves their desire to avail themselves of the Room.

FERTILIZING AGENTS.

At the last meeting of the Boroughbridge Agricultural Society, Mr. **Bainbridge** said that he had been honoured by the society in being requested to give a paper on Fertilizing Agents on that occasion, but he had not prepared a written lecture, and would make a few general remarks on the subject in the hope of provoking a little discussion. The great thing for any person to secure success in life was to take a pleasure in the business they had to follow, and, whatever their occupation happened to be, they must bring to bear upon it that penetrating mind which was able to grasp all that was necessary in carrying on such occupation, and in overcoming all difficulties. This was most important for the agricultural class, for they must possess a perfect knowledge of their business. Depend upon it, a young man taking a farm must, if he meant to be successful, display a considerable amount of good common sense and have clear brains. Professor Johnston had said that the business of the practical farmer was to get the greatest amount of produce from his land at the least possible cost, and without doing permanent injury to the soil. In a word, it was the object of the intelligent and enterprising agriculturist so to manage his farm as to gradually increase the permanent fertility of the soil. That the soil could deteriorate in value in the hands of tenants was an entire mistake, particularly as regarded that neighbourhood, the farms of which were in far better order than when managed by the predecessors of the present tenants. Science was teaching them that they were to restore back to the land as they took from it. They had discovered that the common shales and the iron and coal measures, which were so valuable to the country, were also valuable to the produce of the land. It was calculated that nine-tenths of the fertility of the land was provided gratis by the influence of the atmosphere acting upon it, the atmosphere that flowed around the world. The coal fields of the country turned out annually millions upon millions of tons of coals from the bowels of the earth, and these coals were the sunbeams of a former period; they were what Stephenson called them, the bottled sunbeams of a former age. The burning of these coals produced smoke and soot, and these with the atmospheric air travelled to the plants and crops, and a vast amount of good resulted. In London, with its 3,000,000 of population, there was a vast daily consumption and waste going on, and the gases arising therefrom, and from life itself, were gathered and accumulated, and sent up into the atmosphere. They knew that what would destroy life was necessary for life itself, and they also knew that in London and the largest cities and towns of the kingdom the miasma, if it remained, would carry death around, but it was taken off by the atmosphere, and it answered the purpose that God intended it to answer by spreading fertility over the land. The soil had the power of fully using up all these gases which accumulated so rapidly in large towns, and the leaves of plants especially absorbed a vast amount of these gases, vegetation being ever at work seeking and accomplishing one great object, that of reproducing life from death. So it was, death issued into life, and life lived upon life. Man breathed out carbon, plants took up the carbon, and thus animal life was a feeder to vegetable life. Animal life could not exist without vegetable life; and vegetable life could not exist without animal life, and this process was carried on through the atmosphere. He next came to another question. The soil must be well opened out, and turned up to the influence of the sun; and when so exposed, the rain came, andsupplied it with that which it must of necessity have. The point then was, to make the land in a fit state to receive it. Proper ploughing was the thing very much required, especially for strong lands. Deep ploughing turned up the soil well, and enabled the atmosphere to play upon it, and it would then stand rain, frost, and snow. Strong as the land might be, deep ploughing gave room for the roots of the plants to run down and live. By ploughing deep, the bad soil, if any, from below was brought up to the surface and was operated upon by the atmosphere, and would become good soil eventually. Some persons objected to bringing up this inferior kind of soil to the top; but he saw no objection to it, as the plants did not derive their nourishment from the surface of the land, but from the soil immediately below it. From a book which he had seen on Flemish farming, it seemed that the surface of the land was sand blown, but it was the most fertile land in Europe. The secret of this extreme fertility was the deep working of the land, from fifteen to eighteen inches deep. Forage crops were grown for their fertilizing power. Lucern and clover grew to a great height, and the atmospheric wave operated upon the leaves, and the beneficial influence was felt upon the roots below. He recommended deep ploughing and the pulverizing of the soil, which would then be the better able to produce good crops, and afford plenty of food for man and beast.

Mr. **Steele** said that he agreed with some parts of Mr. Bainbridge's remarks. As regarded Flanders, the land was very well cultivated indeed; and whether it was the manure but into the land or deep ploughing that produced a good crop, the atmosphere no doubt had a great deal to do with it. If there were two fields, one of which was manured well and the other not manured at all, that which had had manure applied to it would have a much better crop than the other. The sand carried upon the land from the sea shore at Flanders would absorb a large amount of gas and atmospheric air. The manure part of the question as regarded fertilizing agents was left out altogether by Mr. Bainbridge in his remarks.

Mr. **Bainbridge** said that he had done so designedly, manure being another part of the subject altogether. He only intended to go into the atmospheric influences upon the soil on that occasion.

The **Vice-Chairman** said that the members were much indebted to Mr. Bainbridge for the manner in which he had treated the subject, as respected the influence of the atmosphere on the soil; but he must say that he was somewhat disappointed, inasmuch as he was led to suppose that Mr. Bainbridge would have conveyed to the meeting some information as to the effects of the agency of artificial and other manures upon the land. Many old-fashioned farmers, in managing their land, believed that "muck" was everything, and many of them had tried experiments with artificial manures. Atmospheric influences upon artificial and farm-yard manure they had some knowledge of, and if Mr. Bainbridge had said something about the use of manures he might have given them some hints of a useful kind. Mr. Bainbridge had not alluded to a manure fertilizer of any kind, and there was one of a very important and valuable description to which he might have referred, namely, the sewage of our cities and towns, a fertilizer which was very much neglected. That description of manure would very much benefit the land, increase the profits of the farmer, and be of advantage to the nation at large. Mr. Bainbridge had had a long residence in the city of York, and he thought that he would have been able to give some information upon sewage, which was one of the most valuable manures to the agricultural world. That being the case he hoped that Mr. Bainbridge would at some future time take up the manure part of his subject. They knew about atmospheric influences, and he trusted that Mr. Bainbridge would turn his attention to sewage and other manures, and give the society the benefit of the information he might derive at some future quarterly meeting.

Mr. T. **Scott** said he expected that Mr. Bainbridge would have said something about artificial manures, but he had not done so, and he felt rather disappointed. He did not approve of the very deep ploughing mentioned by Mr. Bainbridge, showing that it would not answer, and if carried out it would require the employment of a large number of horses.

Mr. **Bainbridge** considered that deep ploughing would be found to be valuable when the steam plough came into more general use in their fields. Ploughing would then be easy straight sailing work, and by getting deep and arriving at the subsoil they would get what they wanted, and bring it up to the surface.

The **Vice-Chairman** said he happened to know something about the steam plough in connection with its trial at Wakefield. A gentleman who had spent two days in ploughing by steam had shown him the effects produced. They were disastrous to his farm, for the steam plough got upon some rocky soil and turned up materials which were injurious to the land, and the gentleman had never grown a good crop since.

Mr. **Mason** said he knew of a farm where the steam plough had been used, and the ploughing carried to a depth of eleven or twelve inches. After that the atmospheric influences had been at work, but when the crop of corn was reaped it was not at all out of the common way.

The Boroughbridge Agricultural Society. — The following are the other subjects selected for discussion in 1867:—April 6th, on "Highways and Byeways," by Mr. A. S. Lawson, Aldbro' Manor; July 6th, on "The Management of Sheep," by Mr. Thomas Scott, Broom Close; October 5th, "Farm Labour, its condition and prospects," by Mr. C. F. G. Clark, Heaton House.

VIVISECTION IN THE FRENCH SCHOOLS.

From time to time reports reach us of the horrible barbarities practised in the French Veterinary Schools; and a description has just been going the rounds of the papers detailing atrocities even more dreadful than heretofore. Horses are systematically cut up alive. The operations begin early in the forenoon; and at three o'clock in the afternoon, as an eye-witness writes in the *Veterinarian*, "the poor wretches had ceased to make any violent struggles; but the deep heaving of the still panting chest, and horrible look of the eyes, when such were remaining in the head, while the head was lashed to a pillar, were harrowing beyond endurance. The students had begun their day's work in the least vital parts of the animal. The trunks were there; but they had lost their tails, ears, and hoofs; and the operators were now engaged in cutting down on the most sensitive parts. One animal had one side of his head completely dissected; and the students were then laying open and cauterizing the hock of this same animal." This was the result of a few seconds' observation, when the visitor, and no wonder, "grew quite sick, and hastened away from this abode of cruelty."

There is, as we should hope, scarcely an Englishman, or a horseman, but who would witness such a scene with the same feeling of loathing and disgust. The stronger, moreover, must be our protest when we come to consider the cloak under which such enormities are committed. One of the special missions of science and civilization, twin-sisters who should ever walk hand in hand, is to war against the excesses of our forefathers. We seek to refine, not brutalize; and we live in an age when the most trying operations may be performed with little or no suffering to the patient. Is the surgeon losing his skill because he has the victim no longer writhing and groaning under the knife? Is justice less certain in her course though the witness be not put to the torture, nor the prisoner half-broken on the wheel? It was, we had thought, only the savage who now boasted of his cruelties, and who slowly roasts his enemy, just as in bygone times we floated our witches or flayed our heretics. Gross, miserable ignorance could be the only excuse for such doings as these; whereas the present plea for acts altogether as abominable is the pursuit of knowledge!

The French perhaps of all nations plume themselves upon their acquirements, mental cultivation, and the observance of those good manners which do so much to civilize mankind. They assume to excel other people proportionately in the Fine Arts and such other landmarks of progress; and it is for this reason, most probably, that they set their students to cut up live animals, and to habitually defy the first instincts of humanity. And with what result? So far, we are happy to say, with little or no justification for the disgraceful outrages perpetrated in the name of science. Does the French veterinarian, with all these "advantages," know more of the horse in health and disease than the English practitioner? Not he; and in nine educated men out of ten, not so much. Our neighbours are deservedly becoming celebrated for their horses; but they have English grooms to look after them, and English jockeys to ride them; as an English trainer will often be quite equal to a French professor, though he may not have gouged the eye out of a live horse's head, or slowly tortured a poor beast to death under the plea of anatomical research!

The French School, however, has at length found a champion even amongst Englishmen. Mr. John Gamgee of the Albert Veterinary College, is "astonished at the manner in which the learned bodies of three of the greatest of our European Schools have been held up to odium and contempt, when it has been from these very schools that the humanizing influence of a sound veterinary education has emanated." Humanizing! Was there ever such a word in such a place? *Humanizing!*—where the student begins by cutting off the live horse's tail, ears, and hoofs, and goes on with the assistance of a friend to open the head and hock at the same time! Mr Gamgee says "within forty miles of enlightened Edinburgh, he has known a cow-leech, not a veterinarian, who first cut a cow's tail and salted it for the 'tail ill'; then excised both haws or third eyelids, because the same poor animal was thought to have even the 'howks'; and, lastly, the same man on the same unrelieved animal took a pair of shears, and clipped off the beautiful papillæ on the membrane lining the cheeks, thinking that after all perhaps the disease was the 'pikes.' This must not be thought rare practice, though perhaps the refinement of trying all three operations on one animal is unusual." Precisely so: Mr. Gamgee himself draws the distinction. The man he speaks of was a cow-leech, not a veterinarian, or one who committed these enormities from sheer ignorance, but not wantonly, as his desire was to benefit the poor beast he was torturing. But what are this poor cow-leech's experiments compared to those of the learned Frenchman? Instead of cutting the cow's tail he would have cut it off; instead of excising her eyelids, he would have forced her eyes out of their sockets, and instead of clipping the lining of the cheek he would have laid bare the head. Three operations on one animal are, we hope as Mr. Gamgee says, "unusual" here, though they are by no means so in France, where three or four are often being proceeded with at once. But we are to look to "the beam in our own eye," although one shudders involuntarily at such a phrase when discussing the practices of these foreign veterinarians. The French can "turn the tables" upon us: "We complain of their inflicting a certain amount of animal suffering, but they do this under the deeply rooted conviction that it is the only way to secure the efficiency of their highly educated and numerous body of veterinarians, which is constantly engaged in the prevention and cure of disease. In order to promote the same object, the Government spends its twenty and thirty thousand pounds per annum on its veterinary colleges. The numerous departements in France have their scholarships—'bourses et demi-bourses'—and there is a perfect veterinary organization over the whole country, so as to reduce disease and suffering to a minimum."

And how has this answered? or, as Mr. Gamgee puts it, "what did the French Government do, so soon as it heard of the cattle plague in England?" Simply stamped it out on the frontier, as apparently their veterinary surgeons knew no more of the disease, or displayed no more ability to cope with it than did our own, and that is saying something, too. We wonder whether vivisection has yet been extended in the French Schools to cows and oxen? However, it seems we owe a deal to the foreigner in one way or the other: "We have lost millions of animals since 1842, which never could have been lost had we not admitted the foreign ox, in ignorance of foreign diseases, into our markets and fold-yards. When a student in 1851, I was amazed to find that no one thought or seemed to know anything of the subject. I visited dairies, slaughterhouses, and sausage factories. Talk of cruelty! it is impossible to conceive anything more frightful and revolting. It was no uncommon thing for me to see twenty and thirty diseased cows carted away dead from a single yard containing a couple of hundred animals. Fancy their sufferings unrelieved through ignorance! The French may have cut up five thousand horses in a quarter of a century; we have caused the painful lingering death of a minimum of twenty million animals in the same time, and it has been impossible to get a proper system of disease prevention inaugurated."

Was there ever such an argument as this! Because we have lost so many thousands of *cows*, ergo the Frenchmen were justified in cutting up alive so many thousands of *horses!* Whereas, if there was a necessity for their cutting up anything, it should have been the poor cows, as they seem to know of no other grand recipe, so far, beyond the stamping out. The *prevention* of disease is not Science, Mr. Gamgee; and if our Government is to spend twenty or thirty thousand per annum on the veterinary schools, and to fill the Veterinarians' "pockets with gold," it must be for something more than *prevention!* Any organized body of inspectors might be made equal to that.

The more we look into this matter the less reason do we see for the abominable cruelties countenanced in the foreign Schools. A man, a young one more particularly, cannot but be the worse for being made callously familiar with such wanton torture, and we hope that Englishmen will ever denounce the practice as energetically as they now are doing. Mr. Gamgee, to be sure, is the great exception. He would have us apologize for "haste and hard words;" and he will "hold himself personally responsible for the becoming, considerate, and impartial action of the Veterinary Professors of France," whatever this may happen to mean. But then Mr. Gamgee "does not wish us to suppose that he did not operate on living animals in France," which possibly means to say that he did; and this, indeed, is about the only great fact we find in support of the system.

THE SCAB IN SHEEP.

This is one of the most troublesome and obstinate infections with which flockmasters have to contend. There is something derogatory and discreditable connected with it; at least so it is considered. All owners of flocks feel a degree of shame or disgrace attached to them, when visited with this pest. It seems as if some gross mismanagement had to do with it. Neighbours listen and talk in whispers about it, ; *i.e.*, "Mr. A——. has got the scab in his flock: be cautious. What has he been doing? How careless! how foolish! Why did he do so? How did he get it?" this reasonable question generally coming last. The fact is, that it does often break out, and no one knows how or from whence it comes, but all know that it can only come by contact either with infected sheep, or from the lairs or fences where infected sheep have been located. It is analogous to the itch in the human frame—vexatious enough, but often unavoidable—and, like it, is under concealment as much as possible. No one likes it to be known in either case. Sheep, when deeply affected with it, are almost unsaleable; hence one great reason for concealment. It is an extremely unpleasant and trying visitation, but it does not involve much actual loss in the flock if under intelligent and careful management. Very serious losses, however, do occur from ignorance and gross mismanagement, which I shall presently explain. One of the greatest boons that could be conferred upon flockmasters would be the discovery of an infallible remedy for the disease. Another and very considerable benefit would be derived from the passing of a law to make the exposure of sheep in market or fair, knowing them to be thus affected, punishable. At present all is left to the honour of parties, if through their means such outbreaks do take place, and seldom any compensation is made. Many think it hard to press it, as all in turn are liable to the mishap. It is by no means a decided question whether the sale of infected sheep is unwarrantable. A case of sale of scabbed sheep was tried in Lincolnshire some time ago, which caused some local notoriety. The person suing for compensation was nonsuited owing to the evidence of the leading graziers in the county testifying to the fair exhibition of all sheep in the market, and that the buyer must be satisfied as to the state of the sheep before purchasing, or take the consequences. This is not my law: the buyer cannot detect such infection in its earlier stages: if actually broken out, he is a novice who cannot detect it.; still it is unpardonable for a seller to palm sheep upon a customer as all right, when he knows to the contrary. It is supposed by many to be a cutaneous affection of easy cure. I can with pain say that I have not found it so; in fact, I have often thought it much harder to cure at one time of infection than another, and have been led to suppose that the little minute insect which causes the infection to be of more than one variety. I have at times cured the scab, when fully developed, without much loss, by mercurial ointment. At other times, dress as I might with the same ointment of like strength, I utterly failed, and I have used as much as a pound and a half to a sheep. I have frequently noticed the same results attend the efforts of my neighbours. I am not well acquainted with entomology, and shall therefore retain my view of there being more than one variety of this mischievous insect, till I see the contrary proved. I breed rams for sale and letting, and am sorry to say I seldom get over a season without having one or more returned pretty well troubled with this disease. Hence the cause of my large experience. I much wish some good entomologist would take the trouble to enlighten us as to the varieties of this insect. I feel sure some are more tenacious of life than others, and also more active and fatal in their attacks upon the skin of the poor sheep. The manner of attack is generally known from the many reports published and essays read upon Scab in Sheep. I shall only remark that the insect speedily buries itself below the skin when located upon the sheep. It there with its progeny feeds, and little or nothing is discovered of its abode till some considerable change in the weather occurs, as frosts, snows, or rains. The two latter will soon bring out the scab, and frost will sometimes do it. Inflammatory action of the skin takes place after wetting, and is soon followed by the rising scab. If this is not quickly looked to, and a dressing of some kind applied, it will spread over the whole animal, and almost render it wild with irritation. The itching is intolerable. The animal soon ceases to thrive, and is constantly trying to find places, *i.e.* gates and posts, to rub itself, and thus spread the infection by leaving some of these little enemies upon the rubbing posts or places, to be taken off by other sheep in rubbing too.

Most flockmasters are too well acquainted with the tiresome affection. The great question is as to the mode of cure. I will just premise that I know of no certain cure. All that I have tried, and tried under my own application and superintendence, have occasionally failed. The all-important thing is to follow up well whatever remedy or application is decided upon, till the infection is mastered. Many animals have to be dressed many times over. Every insect must be destroyed or the scab is not cured. The shepherd says, "Oh, see how well the scab rises! it is all right, cured no doubt." In a few months or less, symptoms again appear to his dismay. The insects are not all killed: the dressing must be repeated of course.

The equally important thing is to ascertain what application is most effective. I have used, at one time and another, nearly all the specifics and nostrums put before the public; and all failed, and that repeatedly, however carefully applied. Occasionally they will effect a cure, but they must not be depended upon. These liquid applications are to be preferred to mercurial ointment immediately after the sheep are shorn. They will destroy numbers of insects and retard the progress of the infliction, and in some slightly infected cases effect a cure if properly applied. It appears to me that the whole skin must be moistened by any one of these liquid specifics, or some little hardy fellow escapes; and to make it effectual all must be thoroughly rubbed or chafed in. It is the skin that requires affecting, so that, taking it as food, they eat to their own destruction. This, I presume, is decidedly the case when mercurial ointment is applied: the whole skin is infected with mercury, hence the more certain the cure. I have never found any remedy so sure as mercurial ointment, if properly made and properly applied, but it can only be used satisfactorily when the wool is long enough to divide into shreds; hence the desirability of a liquid application when the wool is too short for shedding. I was an unbeliever in the efficacy of tobacco-water, but last year I cured a bad case upon repeated applications. This would be without actual poison. There appears to be very little danger in the application of any liquid specifics. The animals may be, as in cases of my own, deprived of the use of their limbs for a short time, but no evil arises: but the specific did not cure in one instance, and the others are somewhat suspicious even now. Mercurial ointment is, after all, most to be depended upon; but it requires great care, not only in the application, but in the management of the sheep salved. There is so much danger from cold, and inflammatory action when under salivation which often takes place when strongly dressed. The flock when salved should be kept in a uniform condition, and as free as possible from wet or wet keeping; nor must they undergo a change of food to any extent till the action of the ointment ceases. Immense losses have been sustained from taking sheep just salved from grass, and putting them to coleseed or turnips. The weather has much to do in ensuring safety: cold rainy weather is sure to cause loss in some degree. This very important thing must always be kept in mind—Scab is occasioned by the attack of minute insects, therefore they must be killed, be where they may; hence, fences or rubbing-places should be cleansed. As these dressings are very expensive, it behoves every flockmaster to most carefully watch every sheep, and if any individual animal shows symptoms of a return of scab, by all means remove it at once and repeat the dressing. In extremely bad cases, the sheep should be kept apart, under good shelter.

FOREIGN AGRICULTURAL GOSSIP.

M. Gouet, formerly sub-inspector of forests at Clermont, has just been appointed to the direction of the Experimental Forest School, created more than forty years since by M. De Vilmorin, on his estate at Barres (Loiret). The French government, justly proud of continuing the work of M. De Vilmorin, has become purchaser of the portion of the estate of Barres, where the celebrated cultivator had at his own expense organized the experimental cultivation of exotic forest trees suitable to the French climate. In the erection of the Barres School into a forest establishment of the state, we see a just and striking homage rendered to a memory dear, on many grounds, to French agriculturists. In future, if our information is correct, the Barres estate will be called by a ministerial decree the Barres-Vilmorin School.—It is much to be wished that the experience acquired in England with regard to the cattle plague could be turned to advantageous account in Holland, and that the Central Dutch government, invested by the legislature with sufficient powers, should be able to overcome all local resistance, and impose in the name of the public interest preservative measures of absolute isolation and compulsory slaughter, compensated for by a system of indemnities. Unfortunately, it appears that it has not been possible in Holland to have recourse in a uniform manner to those protecting measures to which England now owes her safety from cattle plague; and the disease still commits terrible ravages among the Dutchmen. In the week ending Dec. 4, 1866, the number of attacks reported was no less than 7,162, or more than double the total recorded in the corresponding week of 1865. After this the weekly totals seem to have happily received a certain check; but in the week ending Jan. 5, 1867, we find that no fewer than 4,988 attacks occurred. The bovine pest prevails particularly in the provinces of Utrecht, and south and north Holland, but it has also shown itself in the Friese and Overyssel districts, while latterly it has attacked several parishes of the Gueldre and North Brabant. Belgium, the relations of which with the Low Countries are very frequent and extensive, now finds itself threatened, and it can only keep itself free from the contagion by maintaining the most vigorous precautionary measures. The authorities and farmers of the frontiers especially must not lose sight of this line of conduct. Holland may be said now to be in an anarchical state with reference to a sanitary police applicable to contagious cattle diseases. England has escaped from a corresponding anarchy, and, contrary to the instinct of its population, has imposed on itself sanitary regulations of extreme rigour. We may judge now, from the relative state of the two countries in the matter of the cattle plague, which of the two systems it will be best to follow.—We learn from Spain that, in the province of Valence, fruit-trees and orange-trees have been suffering from an unknown disease which prevents them from yielding fruits, and spreads misery in all the places in which the orange is one of the principal products. A local landed proprietor, Senor Joaquim Guerrero, has conceived the idea of abandoning ordinary methods of treatment—such as sulphuring, liming, &c.—and he has obtained, it appears, marvellous results. Senor Guerrero has come to the conclusion that it will be possible to escape from the malady only by finding a means of absorbing continually round trees humidity and hurtful miasmata. With this object, he has planted round his trees, and especially round his orange-trees, a woodland plant known as the *pita*, which seemed best adapted for the purpose. The results obtained are, Senor Guerrero says, extraordinary. He recognized the efficacy of his process a few days after the first plantations were made, his orange-trees getting into the best possible state, so that it would hardly be believed that they had ever been injuriously affected.—A great extent of land has hitherto remained sterile and uncultivated in Spain, and during the last few months a law has been promulgated to encourage the growth of population in the agricultural districts, and to stimulate the development of agricultural wealth. By this law special advantages are accorded to all who may establish an agricultural centre, or a farm of 400 acres at the most, at distances of at least 4½ miles from the nearest cultivated districts. The buildings and staff will pay no tax during 15, 20, or 25 years, according to the distances at which they may establish themselves from the cultivated districts. The lands alone will pay during this time the direct contribution which they paid during the year preceding the establishment of the new farm. Heads of families living on the new farms will not have to discharge any public duties except those of an Alcade; all, as well as their *employés*, are to enjoy the gratuitous right of bearing arms; and finally, the sons of proprietors having resided for two years on farms, will be devoted to the reserve force, if their names are drawn at the period of the conscription.—In the course of the past session, Senor Bertrand 'y Aneat, a deputy, presented to the Chambers a project of law, which was taken into consideration, and which had particularly for its object the multiplication of *Crédit Foncier* enterprises. Senor Bertrand 'y Aneat proposes that it should be lawful to create an indefinite number of these enterprises, either by associations of proprietors, or mercantile associations satisfying certain conditions imposed by the law. Without entering into farther details, we may state that Senor Bertrand 'y Aneat entered into particulars and arguments tending to show that increased facility of establishing these enterprises and their multiplication on the national territory was more calculated to promote an increase of agriculture and public wealth than when the same enterprises offered the characteristic of unity which they present in several countries.—Portugal is also occupying itself with the development of agriculture. An agricultural journal of Lisbon, *O Archivo Rural*, informs us that Portugal engineers have been sent abroad for the purpose of studying drainage and irrigation processes. The same journal gives its readers a *mémoire* filled with details of great interest on irrigations in France, Belgium, Italy, and Spain, by Senor d'Almeida d'Eca, engineer.—M. Charles Mallet has some interesting details in the *Journal d'Agriculture Pratique* on the improvement of Algerian cattle. M. Mallet says: "A journey which I made in 1865, in the province of Constantine, has enabled me to indicate the good effects of selection and careful feeding on the stock of M. Foncier de Ruze. The fine cattle which I saw on the farm of El Aria, 15 miles to the east of Constantine, were infinitely superior to the ordinary cows of indigenous herds. If the crossings which have been undertaken thus far have not yielded good results, the fault must probably be attributed to a bad selection of reproducers. The Arab bovine race is a delicate and distinguished one, while it is at the same time sober and rustic; in a word, it is perfectly adapted to the conditions of the country which it inhabits. The two points which leave something to be desired are—first, height; and secondly, production of milk. We may conclude *à priori* that these two *desiderata* will be obtained by a crossing with a breed of great size with good milking qualities and analogous to the Arab breed as regards delicacy and general conformation. Practice has fully justified this theoretical deduction. I have had the pleasure of seeing on the property of M. Schwartz, director of the Geneva Company at Sétif, products proceeding from crossings of Schwitz breeds by Arab bulls, and which in every respect leave little to be desired. The Schwitz breed, which has long been known for its milking qualities, came originally from the centre and eastern part of Switzerland; it has also been met with, almost pure, in the Tyrol and in Bavaria under the name of the Algau breed. The Schwitz cow offers some striking analogies with the Arab cow. Thus there is the same delicacy of hide and members, the same description of horns, and the same grey or brown hair. The most striking difference is in the height, a Schwitz cow weighing three times as much as an ordinary Arab cow. The Schwitz Arab products which I saw at Sétif are of good average height; the yield in milk is very satisfactory, and the delicacy and structure are admirable."

NORFOLK CHAMBER OF AGRICULTURE. — A meeting has been held to consider the question of roads and road-management. The chairman, Mr. C. S. Read, M.P., stated that at a meeting of the Scotch Chamber of Agriculture, the conclusion arrived at was, that old debts on roads should be paid by the owners of lands and heritages, that all repairs should be equally divided between the owners and occupiers of the land, and that all tolls should be of course abolished. This was not only the recommendation of the Scotch Chamber of Agriculture, but of a Royal Commission of inquiry into Scotch roads, which sat some two or three years since, and of which Sir James Ferguson and Sir John McNeil were members; and twelve counties in Scotland had already obtained Acts for the abolition of tolls on these very grounds. In Ireland the whole of the tolls had been abolished, and the roads were all of them repaired by the land assessment, which was divided between landlords and tenants; and he had every reason to believe that the roads in Ireland were in a satisfactory condition. The subject was, however, a difficult one; and it was proposed to adjourn the adoption of any resolution upon it to that day fortnight. In the course of some discussion which followed, Mr. Grimmer, of Haddiscoe, stated that the repair of the roads in that parish cost him, previous to the abolition of turnpikes, threepence per acre; now that the road was maintained by the parish, the corresponding charge was fivepence per acre. Mr. Leamon advocated the maintenance of roads out of the county-rate. Lord Suffield spoke in favour of a system of union-rating. After some further discussion, the debate was adjourned to Saturday, Feb. 2.

The Turnpike Question would threaten to eclipse the Malt-tax as the country-side topic of the coming Session. The subject was under consideration in Cornwall, Herefordshire, and Berkshire, while the Farmers' Club will open with it on Monday, February 4th, and the Chamber of Agriculture follow on the next day.

MESSRS. HOWARD'S PIGS.

The following letter has been forwarded to Prof. Gamgee:—

"Britannia Iron Works, Bedford, Jan. 10, 1867.

"MY DEAR SIR,—The mother of the Birmingham pigs has just brought another litter of nine. Will you come or send some one to mark them, so that they can be identified when six months old? I know you do not, as you stated at Birmingham, think it necessary so far as we are concerned; but if the investigation is to be of any use to the public, there ought to be no room left for doubt. We will of course pay the expenses of the necessary journey.

"I am, yours very truly, (Signed) JAMES HOWARD.

"Professor Simonds has also been invited.

"Professor Gamgee."

[Mr. Law, Professor of Anatomy, has since been down and examined this litter on the part of Mr. Gamgee.]

THE FARMERS' CLUB.

The following subjects have been selected for discussion in 1867:—

Feb. 4.—The Abolition of Turnpikes, and provision for Payment of Trust Debts. Proposed by Sir G. S. Jenkinson, Bart., Eastwood Park, Berkeley.

Mar. 4.—Emigration: What to do, and Where to go. Rev E. Smithies, Hathern Rectory, Loughborough.

April 1.—The Desirability of a Board of Agriculture; as a Government Department. Mr. J. A. Nockolds, Stort Lodge, Bishop's Stortford.

May 6.—The Best Means of Harvesting Crops.

Nov. 4.—The Management of Benefit Societies in Rural Districts. Mr. C. Howard, Biddenham, Bedford.

Dec. 9.—The Present Aspect of Steam Cultivation. Mr. J. A. Clarke, Long Sutton, Wisbech.

THE MANAGEMENT OF MOOR-LAND.—Moor should be cut up into ten-acre squares, and the drain that surrounds these squares kept always open; make minor drains four feet deep and a perch asunder; leave the stuff taken out exposed for a year or two to the action of the air, fill it in again, it will never solidify, and you have a preparation for perfect drainage. When this is done, dig up the entire surface two feet deep; turn it a couple of times; the sun and frost will make it friable, the whole surface will then drain water like a sieve, the drains a perch asunder will take it all away, and now your bog is ready for a clay surface. I have drained moors in this way that pay 40 per cent. The clay was very near the moor, and there were other great facilities. With your steam power and portable railways you can put on clay for £10 an acre anywhere. For twenty pounds an acre the worst acre of the five millions unreclaimed can be turned into a garden worth 40s. an acre. I saw thousands of pounds buried in Irish bogs by pompous engineers who believed that drainage without tiles and stones was against all human reason. My system is really worth your notice. To add five million acres to our own little island, and to get 20 per cent. for the job, is just what would please you I know. Why should you send your money abroad if it can be used at home?—*G. A. K.*

CALENDAR OF AGRICULTURE.

Sow spring wheat on lands cleaned from turnips, and on dry warm lands sow oats, early peas, rye, and beans. Sow barley on turnip lands, and spring vetches on leys and stubbles of good lands, and the seeds of cabbages on borders, for plants to be planted in the fields in May or June.

Plough leys and stubbles in fresh weather. During frosts carry dung, earths, stones, and fuels as may be required; cart stones to drains and to roads.

Continue the feeding of all animals, as directed last month. Begin to use oil-cake for fattening animals, broken or bruised, and placed in troughs, with oats and salt occasionally; the fattening is hastened, and the quality of the dung is improved.

Remove all turnips from the fields without delay.

Flood watered meadows, and lay dung on grass lands during fine weather; bush-harrow and roll the surface during dry weather, and pick off by hand all stones and rubbish that would impede the scythe. Repair fences and gates. Spread mole-hills, and all tufts of dung on grass lands.

Dig hop grounds, open the hills, and apply strong manures, as the best rotted farm-yard dung, rags, composts of lime and salt—all oleaginous substances do well. Dress the roots, and cut off the shoots for sets.

Continue the thrashing of grains as the straw is wanted, and sell and deliver the corn to a ready market, ever the best.

Plant all kinds of useful forest trees—oak, ash, elm, and larch. Set osiers in beds and in rows on low damp grounds. Lay the beds dry, by means of open dividing drains, and dig the ground one year before planting. Cut underwood, and fell timbers during the whole month; plant and repair old hedges, and plant new ones in very moist weather.

Collect manures of every kind, and in every shape and form. Earthy matters mixed with vegetable substances will never in any case fail to answer the purpose; a compost heap, for the reception of all such articles, is a most indispensable requisite on every farm of lands, be it large or small in extent.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Hotbeds of dung and leaves, or of leaves only, with rakings of woods, will contain much withered grass, and are now prepared for raising early asparagus and potatoes, with cucumbers and melons, where these plants are used. No time or material is thus wasted, even on the busiest farms, as two objects are attained—first, the preparation of much manure; and, second, the early production of excellent vegetables which could not be procured by other means.

The weather, though inconstant and changeable, is still proceeding to the better, and will afford fine intervals for the operations of the spade. Peas, beans, carrots, parsnips, onions, and beet-root may be sown on grounds well prepared in autumn, as has been described.

Asparagus plots should be very particularly attended, which may be raised to high perfection, by employing the adequate means: with care and attention the beds will yield a supply for twenty years from a proper foundation. A width of three yards, in single beds; in four together, of double; rows a foot apart, and a space between the rows and beds, the entire width being 15 to 18 feet. The land must be deeply trenched and drained. A good dry soil must be made artificially, if required, by introducing fresh turfy loam, and the whole mixed and incorporated with one-third of its bulk of the best farm-yard dung. Bonedust, guano, salt, and chalk are used with benefit, sprinkled over the beds, which will stand above the level, and may remain to settle till Lady-day.

A similar preparation is required for sea-kale, artichokes, and rhubarb; all which will remain fertile for several years.

Sow twice, or oftener, spring spinach, lettuce, salad, radish, and at the end of the month carrots, onions, leeks, and some vanack cabbage.

Parsley: Sow a full crop, either as edgings or in beds; it lasts for two years; but an annual sowing is the best. Prepare loamy soils for garlick and shallots.

Sow sweet-herbs, thyme and hyssop, savory, and marjoram; and occasionally, where fancy leads, the select plants salsafy, borage, lovage, burnet, angelica, coriander, and chervil; all sown late in the month.

FRUIT GARDEN.

Gooseberries and currants: Proceed with pruning, or the buds will be breaking. Retain the good young wood of the former, spurring but little; the latter require rigid spurring to produce the fruit in closer clusters. Place about six canes in a raspberry bush, sent back to the bud just under the part where the cane takes a bend; then collect and tie them neatly at the summits. Mulch over the ground about the plants without digging it; but remove the wandering suckers.

Prune the wall-fruit trees, as before directed, and finish with pears and apple espaliers, and all the spur-bearing fruit-trees.

Strawberries: Beds and borders may now be planted. Deep, new ground is essential, and the best kinds are the Kean's, for an early crop; abundant crop, pines; and the Queens for medium, and the delicious Elton's, for the latest supply.

Flower Garden.

Sow annual seeds of the best sorts in pots or pans, about the end of the month; use a compost of loam and leaf-mould and old rotten dung of cattle; a gentle heat in the frame will be useful. The common hardier sorts are raised under a glass in the same way as lupines, convolvulus, sweet-pea, Venus' looking-glass, dwarf lychnis, candytuft, &c., &c. In the open grounds, the plants, as they spring up, are often destroyed by worm, slugs, and snails. The beds may be dressed with dung or leafy soil, and pointed in; but are best renewed with a foot deep of fresh loam or virgin-earth, the best of all soils.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JANUARY.

During the greater portion of this month the weather in all parts of the United Kingdom was unusually severe. Outdoor farm-labours were, as a consequence, suspended, even in the most western districts. The large quantities of snow which fell about the middle of the month afforded a complete shelter for the young wheats, and had a most fertilizing effect upon the land. Since the break-up of the frost, field-labours, so far as they have become necessary, have been resumed, and the most favourable accounts have reached us from most quarters respecting theappearance of the young crop of wheat.

The supplies of English wheat on sale in the leading markets have been very limited. Notwithstanding the predictions to the effect that prices would rise rapidly about this period, an unusually small amount of business has been passing both in red and white qualities, at rates barely equal to those current in the previous month. The influx of foreign and colonial produce into the United Kingdom having been liberal for the time of year, and the stocks in warehouse having increased, holders of wheat are now more disposed to sell, at drooping prices. We do not anticipate any serious decline in the quotations; but it is quite certain that they have seen their highest range for several months. There are now on passage to this country over 1,000,000 quarters of wheat, exclusive of full average quantities of spring corn. We shall, therefore, be amply supplied with produce during the next three months. Fine barley and oats have moved off steadily, on former terms; but inferior parcels, including beans and peas, have commanded very little attention. The flour trade has been very quiet; nevertheless, 60s. per 280lbs. has been realized for the best Town-made flour.

On the continent, as well as in the United States, high currencies have been paid for all kinds of wheat and flour. The pretty general opinion is that present quotations will not be supported, although France may require some quantity of produce to meet consumption.

The transactions in all kinds of wool have been very restricted, both for home use and export. In prices, however, very little change can be noted. The quantity of colonial wool now on hand for the February sales is about 30,000 bales, to which some important additions will shortly be made. The auctions are looked forward to with much interest. The accounts from Australia and the Cape are to the effect that the last clip of wool was very large; we may therefore anticipate increased importations this year.

The hop trade has been remarkably firm. For most kinds of hops there has been a fair consumptive demand, at extreme quotations to a slight advance, although the imports from America and the continent have been moderately extensive.

Hay and straw have sold at steady rates. Meadow hay £3 5s. to £4 15s., clover £4 to £5 15s., and straw £1 16s. to £2 4s. per load.

The supplies of food on hand for both beasts and sheep are fully equal to most former seasons. Stock, therefore, has fared well, and increased in weight considerably. The demand for linseed and cakes has been moderately active, and the quotations have had an upward tendency.

In Scotland very few transactions have taken place in wheat, at barely stationary prices. There has been a steady business doing in fine barley and oats, at very full prices. Most other articles have ruled very inactive. The supplies of produce forwarded to the south have been limited.

The quantities of produce on sale in the Irish markets have been trifling. Nevertheless, the trade generally has been in a most inactive state, on former terms. Very little grain has been purchased by English houses.

High prices have been obtained for potatoes, the receipts of which in the London market have fallen off considerably. The supplies in the hands of growers are represented as very moderate.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The supplies of beasts on sale in the Great Metropolitan as well as the leading local markets have been again very moderate. In the early part of the month, the demand for all breeds was very inactive, at about stationary prices; but in the third week a considerable rise took place in the quotations, owing to the severity of the weather, and the difficulties in forwarding stock for sale. Since then, the trade has ruled very quiet. It is satisfactory to know that the beasts have made their appearance in greatly improved condition.

The arrivals of sheep have been much restricted, but of full average weight. Most breeds have ruled steady in price. The best old Downs have sold at from 6s. to 6s. 4d. per 8lbs.

The few calves on offer have sold at high currencies.

The demand for pigs, owing to the rapid increase in the number in most parts of England, has been extremely heavy, and the best porkers have declined to 4s. 4d. per 8lbs.

The total supplies of stock exhibited in the Metropolitan Market have been as under:

	Head.
Beasts	18,150
Sheep	82,400
Calves	756
Pigs	1,508

Comparison of Supplies.

Jan.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1866	24,620	320	89,390	1,754	2,225
1865	20,669	376	73,714	1,095	2,370
1864	19,442	452	80,230	1,019	2,567
1863	20,455	450	83,422	1,637	2,456
1862	20,680	502	82,160	853	2,850
1861	17,612	505	75,240	677	2,000
1860	20,500	535	92,425	1,067	2,045
1859	19,805	364	90,620	921	2,400
1858	20,312	572	80,742	1,108	1,759
1857	19,947	355	81,200	1,071	2,355
1856	17,532	435	101,600	757	2,930
1855	19,717	500	120,460	962	2,625
1854	19,687	510	95,080	887	2,279

Compared with the corresponding month in 1866, the imports of foreign stock into London have been moderate, or as follows:

	Head.
Beasts	5,907
Sheep	16,233
Calves	912
Pigs	1,032
Total	24,084

Imports at corresponding periods:—

Total in 1866	25,838
" 1865	16,952
" 1864	9,907
" 1863	11,893
" 1862	8,783
" 1861	2,708
" 1860	6,760
" 1859	9,264
" 1858	2,342
" 1857	4,633
" 1856	3,292
" 1855	9,102
" 1854	7,919

The arrivals from our own districts, as well as from Ireland and Scotland, thus compare with the two previous years:—

From—	Jan., 1867.	Jan., 1866.	Jan., 1865.
Norfolk, Suffolk, &c. ...	6,900	6,900	9,400
Lincolnshire	1,500	5,290	—
Other parts of England	5,000	3,100	3,400
Scotland	1,292	2,850	1,498
Ireland....................	258	800	557

The highest price for beef has been 5s. 10d.; mutton, 6s. 6d.; veal, 6s.; pork, 4s. 8d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Jan., 1866.					Jan., 1863.				
	s.	d.		s.	d.	s.	d.		s.	d.
Beef from............	3	4	to	5	2	3	4	to	4	10
Mutton	4	4	to	6	8	3	6	to	5	10
Veal	4	0	to	5	8	3	8	to	5	0
Pork	4	0	to	5	4	3	8	to	4	8

	Jan., 1864.					Jan., 1865.				
	s.	d.		s.	d.	s.	d.		s.	d.
Beef from............	3	6	to	5	2	3	6	to	5	6
Mutton	3	8	to	6	0	4	2	to	6	2
Veal	4	0	to	5	6	4	4	to	5	8
Pork	3	6	to	4	6	3	4	to	4	8

Immense supplies of meat, including over 8,000 tons from the Continent, have been on sale in Newgate and Leadenhall. The trade, therefore, has ruled inactive, at fluctuating prices. The latest quotations are: Beef from 3s. to 4s. 6d.; mutton, 3s. to 4s. 8d.; veal, 4s. to 5s. 4d.; pork, 3s. to 4s. 4d. per 8lbs. by the carcase.

MID-KENT.

Notwithstanding the prediction of our elders, who have often enough asserted and re-asserted that we never have winters now-a-days like those of former times, we seem likely to be visited this season with one of sufficient severity to satisfy all the requirements of those who expect potato disease, cattle disease, and the other evils to which the farmer is heir, to vanish when the thermometer sinks low enough, and the face of mother earth is hidden from view sufficiently long. Beneficial as doubtless frost with snow is in many respects, it has its dark side also: the cattle feel it, and, worse than that, the poor feel it too. Loss of work at a time when more clothing, food, and fuel is wanted, brings with it feelings anything but grateful for the change from mild to severe weather, with which the present year succeeded the last one. It was somewhat fortunate, however, for the brute creation, that food for them was more plentiful than on a former occasion, the hay crop of last year being more abundant than for some years past; and, in a general way, the straw was well got in, only the demands on this article, and the tempting price offered for it at the paper-mill and elsewhere, too often strip our farm-yards of their proper allowance of litter. Be this as it may, the present severe weather will soon be a heavy tax upon us in the way of furnishing fodder for all our stock, as, although turnips have on the whole been tolerably good where sown early in the season, the late harvest and wet ungenial weather that followed prevented the stubble turnips, cole, and other crops of that kind, attaining the size they would have done had they had an earlier start. Fortunately, however, for us, the cattle plague has not visited the neighbourhood, or but very slightly, and the sheep on the whole keep healthy; and the mild open weather up to the end of the past year favouring all out-door operations, as well as enabling our flocks to go on without artificial feeding, we have not much cause to grumble. Our greatest anxiety is lest the present severe weather continue too long, and leave not sufficient time for the due performance of the vast amount of spring work which at all times has to be done. The late frosts, however, have enabled the dung-cart to be used to advantage in the hop garden and elsewhere, but the work has been anything but easy to the horses employed; the snow, from six inches to a foot deep, and with frequent accessions, has made travelling very laborious. This covering of snow will no doubt be beneficial, and we hope its effects will tell to advantage hereafter; but its continuance much longer with us will render it difficult to contrive profitable employment for our labourers, for most of the jobs about the yards are done, and the compost heaps being mostly carted away, little remains to do in that way. In our own case the grubbing-up of a piece of coppice has served a good purpose hitherto, but as every one has not such a resource to fly to, we expect to hear of many casual labourers here out of work; in fact, many are so already, while many of those whose winter work is often piece-work, as wood-cutting, fruit-tree pruning, and such like, find it impossible to follow their calling so advantageously in severe weather as when it is mild, and consequently to a certain degree suffer.

SOMERSETSHIRE.

No doubt the nature of the weather during the past month, although barren as regards getting in and securing crops, is of some importance to the coming seasons. Winter appeared to be keeping away buds in the hedges, which were assuming a green hue, and the pear-trees in the garden put forth premature blossom, and the general forwardness of the bud placed them in danger with severe frost. The year commenced with a complete change, and on the 4th the mercury went so low as 3½ degrees above zero, showing a greater intensity of cold than we have had for six years. Considerable damage was done to potatoes not securely covered: great loss from this will arise; while a fall of snow preserved the young wheat and other tender plants: this snowstorm fell about 9 o'clock on the evening of the 1st, and only lasted about one hour, but was three or four inches deep. When the frost gave out on the 5th and 6th, our pastures were looking green, and vegetation showed very little of the severity of the short frost. On the 11th the wind went round to the north. It began to freeze on the morning of the 12th, when we had another snowstorm, followed by a severe frost, the mercury going down 8 to 12 degrees above zero for several nights: this has destroyed many tender plants that have lived through several previous winters: winter brocoli generally destroyed. Fears, from the very cold winds of the 20th and 21st, were beginning to be felt for the young wheat plant where exposed, from the lessened snow not being a sufficient protection. On the evening of the 22nd the wind changed, and about 8 o'clock in the evening it began to rain, and by the next morning such a sudden change of temperature as is seldom recorded: the snow rapidly melted where it lay, and the land again assumed its green aspect, with some exceptions. During the frost the consumption of hay was very great; but we do not hear of much sickness or loss by death amongst the stock. So much, then, for the weather. Our fairs and markets—which except for sheep, and at Bristol and Glastonbury for fat cattle, are still closed—the supplies of sheep have fallen off, and the supply of beasts is by no means large since the end of the year: the few brought to Glastonbury were soon disposed of, and we do not hear of large supplies anywhere. Transactions in poor sheep have been very limited; very few brought to market. Except for the early horned ewes, most successful in-lambing, the lambing season has but just commenced: the change is very favourable. Dairymen will want their dairies made good; and there is an inquiry for cows and calves. Cheese has been a dull sale, at rather drooping prices, but still high. Butter even in dairy district 1s. 4d. to 1s. 6d. per lb.: this article increases in price every season, and has for some years past. Little has been done in the purchase of barreners: they have commenced with about the prices of last year. Fat pigs have gone down below 10s. per 20lbs.: they are plentiful just now, and not profitable, from the high prices of feed: poor ones are fully one pound lower than they were before harvest. Wheats, without any rise in London, have gradually advanced in this county; but whites are held firmly for 8s. 6d. (62lbs. per bushel), and in some instances obtained. Millers cannot afford, at the price of flour, over 8s. 3d. to 8s. 4d.; 7s. 6d. to 8s. for Nursery. The supply latterly has increased, and, were it not for speculators, would have prevented the gradual rise, as, without any advance in London since the commencement of the year, wheat has gone up here 3d. per bushel. Flour is not a free sale at 47s., although in some instances something over is obtained. Malting barley, from its scarceness, is as high as 5s. 4d. to 6s. 3d.; extra may obtain a little over. Beans 5s. 9d. to 6s. 3d.; in some instances Belgian, taken before the rain, 6s. 6d. Very few peas offering. Grinding barley 4s. to 4s. 6d. Oats 22s. to 28s. (32 to 40lbs. per bushel) During the frost the condition of the wheat over much improved; since the rain it has gone back, and it is a bad time to sack it.—Jan. 25.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BANBURY FORTNIGHTLY FAIR.—We have not, since the relaxation of the cattle-plague regulations, seen so large a supply of beasts. The sheep fair also was well supplied. Trade in both markets was brisk, and prices averaged, beef from 4s. 6d. to 5s., and mutton from 5s. to 5s. 8d. the 8lbs.

BOSTON SHEEP MARKET.—A small show of fat sheep, with no material alteration from last week's prices. There were a few pens of hogs, which made good prices, some as high as 52s. a head.

BRIDGNORTH FAIR.—There was a poor attendance, and fine wethers sold at 8½d. per lb. Ewes went cheaper. Pigs sold a trifle higher than last fair.

CHURCH STRETTON FAIR.—Pigs were sold at very low prices, competition being dull.

DUMFRIES PORK MARKET.—The supply of green pork was much less than last week, the number of carcases being 606, or 128 fewer than at last market. There was a large attendance of curers, and a brisk demand, which, with the smaller supply, caused the market to be over before daylight. There was an advance of 1d. to 2d. per stone. The best carcases, 12 to 15 stones weight, were bringing 6s. 5d. to 6s. 6d. per imperial stone, the latter figure being given pretty freely; heavier carcases, 6s. 3d. to 6s. 4d.; large carcases and undersized ones from 6s.

FORRES MONTHLY MARKET.—Owing to the severity of the weather, there was a very thin attendance. Prices were good, and almost all the cattle changed owners at fair average rates of value. Mr. Fraser, Grieshop, sold a lot of five crosses at £24 a head; Mr. Mitchell, Wester Alves, a lot of two-year-olds at £20 10s.; Mr. Forsyth, Waterside, a pair of queys for £31 10s.

GLOUCESTER MONTHLY MARKET.—The number of Sheep was small for the season, but the quality generally was good. Best Downs realized 9½d. per lb., and second quality 9d., while a few inferior pens were sold at 8½d. There were few Pigs, and those sold at from 9s. 6d. to 10s. per score.

IRISH FAIRS.—BALLYBAY: Pigs last night and to-day about 1,500 to 1,600; very low prices, especially for some. Hogs in better demand. Several were brought home unsold, prices offered being barely what would feed them. Very few cows and horses offered, owing to the inclemency of the weather. Those offered being good beasts, were sold at high prices. Young cattle not in demand at present. Sheep and lambs number small; prices rather lower.—ATHLONE: The supply of pigs was unusually large, amounting to at least 2,000; but the prices, numerous as purchasers were, did not exceed those realized at the late fair of Ballinasloe, say from 42s. to 44s. per cwt. The supply of cattle and sheep on the fair green to-day was unusually small. The general tone of the day's fair may be quoted thus: three-year-old heifers ranged from £12 to £14; two-year-old ditto from £9 to £11; yearling from £3 to £9; three-year-old wedders from £3 to £3 5s.—MARKETHILL: Beeves may be quoted at 7½d. per lb. for best meat. Springers were in fair supply, and sold well; prices from £9 to £16 10s. Back springers were much in demand at high figures; milch were scarce and prices also high, averaging from £8 to £14, according to quality of animal. Young stock was scarcely visible, and there was no demand. Mutton averaged 8d. per lb.; sheep very scarce.—ENNISCORTHY: All kinds of stock, with the exception of pigs, sold considerably higher than at last month's fair. Beef went up to 60s. per cwt.; springers sold dearly, and generally brought from £14 to £19; good milch cows may be quoted at the same price; strippers scarce, from £10 to £18. There was a good supply of yearlings, which met with ready purchasers at from £4 to £6 each; two-year-old cattle went from £8 to £11; three-year-old store heifers in good demand, sold high, from £12 to £15. Mutton may be correctly quoted at from 7d. to 8d. per lb.—TULLOW: There was a good supply of cattle, considering the severity of the weather. Beef, 55s. to 57s.; mutton, 7d. to 9d. Milch cows from £12 to £18 each; springers, £10 to £15; two-year-old heifers, £7 to £9; yearlings, £5 to £6; half-year-old calves, 30s. to 50s. each; good ewes, 45s. to 50s. each; hoggets, 35s. to 40s. each. At the pig fair on Saturday the supply was limited; prices 43s. to 45s. per cwt. Stores, 20s. to 30s. each; bonhams, 12s. to 15s. each.—CASTLEDERMOT: Hunters in some cases went to upwards of £110. Farmers' and inferior nags brought the usual fluctuating prices. Beef 60s. per cwt. Springers realised from £14 to £20 each, milch cows from £13 to £19 each, strippers (the supply not equal to the demand) £10 10s. to £13 10s. each. In the store department—Yearlings £4 10s. to £5 and £6 each, two-year-olds £8 to £11 10s., three-year-olds £12 to £15 10s.; mutton from 7d. to 8d. per lb. Wethers sold well at from 50s. to 54s. 6d. each, ewes 44s. to 50s., two-year-olds 38s. 6d. There was a pretty fair supply of pigs. Good bacon and porkers about 49s. per cwt., inferior 45s. Good stores in demand at £2 10s., inferior 35s., bonhams 34s. to 40s. per pair. SLANE: The supply of stock was large, and a good number of purchasers. The following prices were obtained in the various departments:—Beef, from 45s. to 65s., and all bought up. Three-year-old bullocks scarce, from £12 to £16 each; two-year-olds from £8 to £11; yearlings from £6 to £8; three-year-old heifers from £11 to £14; two-year-olds from £7 to £9; yearlings from £4 to £7 each; springers (few) from £11 to £20 each. Good ones were bought up early. Strippers from £8 to £12 each. In the sheep fair there was a tolerable business, victuallers buying up pretty actively; wether mutton of best quality reached 9d. per lb.; ewe from 6d. to 7d. per ditto. The swine fair was remarkably well attended by purchasers, and bacon maintained fully the rates of late fairs—say 45s. to 48s. per cwt., sinking offal.

PRICES of BUTTER, CHEESE, HAMS, &c.

BUTTER, p. cwt.—	s.	s.	CHEESE, per cwt.—	s.	s.
Friesland	122 to	126	Cheshire	78 to	88
Jersey	90	114	Dble. Gloucester	74	78
Dorset	—	—	Cheddar	80	90
Carlow	—	—	American	66	74
Waterford	—	—	HAMS: York	90	98
Cork	—	—	Cumberland	90	98
Limerick	—	—	Irish	—	—
Sligo	—	—	BACON:—		
FRESH, per doz., 14s. 0d. to 18s. 0d.			Wiltshire	64	68
			Irish, green	56	60

CARMARTHEN BUTTER MARKET, (Saturday last.)—The market continues quite firm, from 114s. to 116s. per cwt. Fair demand. Cheese also firm, and tending upwards.

CORK BUTTER EXCHANGE, (Saturday last.)—There were 2,319 firkins weighed out this week, of which 33 were mild-cured. The demand was limited, and the prices were closed for the greater part of the week, no transactions having taken place in butter. On Thursday the prices were 120s., 112s., 90s., and 72s., and of mild-cured 125s. and 104s. The present dulness has been chiefly caused by prices being forced too high.

GLASGOW, (Wednesday last.)—A large supply of cheese, and a fair, but not very active, business doing. About thirty tons passed the weigh-house scales. Dunlop, prime 64s. to 67s., secondary 56s. to 61s.; Cheddars, prime 67s. to 71s., secondary 62s. to 65s.

GLOUCESTER.—There was a small supply of Cheese, and it was quickly bought up, best as from 72s. to 75s., and seconds at from 63s. to 64s. per cwt.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

January 1867 has undergone greater fluctuations than for many long years have been known. The last day of the departed year certainly indicated a change, but no one anticipated its extent or the severity of the frost. Then, before a week was up, came a thaw, and afterwards a frost, more severe and lasting, without the same snow protection; this being followed by an equally decided change. Storms have consequently scattered wrecks all round the coast, shipping have been driven from their moorings in the Thames by masses of ice, and over 40 human beings have been lost in the Regent's Park, by venturing on the treacherous ice. All outdoor work has been stopped in farming, and though some reports are favourable as to the appearance of the young wheat on the light land, there are others quite the reverse on the Essex clays, where the plants are hardly visible in some places, and the slugs have played much havoc with the well-grown plants. Beyond this, some root clamps have been invaded by the frost, and much wheat remains unsown. For the first three weeks the wheat trade remained, like the country, frost bound, with prices nominally firm. But after the second thaw had lasted for a week, people seemed to become suddenly alarmed as though spring had come, and every European port was opening to furnish fresh supplies. The London market then gave way about 3s. per qr. for English qualities. There are, however, other circumstances that may have influenced the trade; about one million quarters are now afloat, chiefly bound for England, and though much of this may not arrive for months, and part be diverted by foreign orders, buyers are discouraged. Again, the French Government for political purposes have been making purchases, and tampering with the Paris flour trade, and as France was lately the mainspring of our advance, caution has followed confidence; and further, the Commissioner of Agriculture, at Washington, again contradicts the reports of an excessive failure in the American crops, maintaining that there is 640,000 qrs. more wheat this year than last, though of inferior quality. This reaction may be expected after a heavy advance in prices; but it is strange, if America has a fair average crop, New York is not better supplied, and that our sharp cousins should be content to pay higher prices than our own; while if the recent reports of deficiency in France be true, as they are, no doubt, with regard to ourselves, no Government interference will produce more corn than exists, though a check may for a time be imposed on the upward movement. Time and the opening of spring will clear up these mists, and show us better what we may expect. The following rates were recently paid in the places named: White at Paris 76s., red at Liege 66s., at Mayence and Manheim the same, at Hambro' 64s., also at Rostock, at Stettin 58s., at Cologne 62s., Banat: at Vienna 54s. Red sorts: Odessa 46s. to 51s.; white at Danzic 62s.; Spring wheat at New York 61s. 6d. per 480lbs.

The first Monday commenced on a moderate arrival of English wheat, but there was a good supply of foreign. There were not many fresh samples sent up from Kent and Essex in the course of the morning, but a very decided thaw having set in after an intense frost, which lasted up to Saturday morning, the upward tone of the market appeared abated, and there was but little disposition to do business on the part of millers, who, in the few purchases made, would not exceed the previous rates. Some French orders being still on hand, the prices of foreign were firm, but the consumptive demand was retail. Cargoes afloat, however, realized an advance of 1s. per qr. Business in the country this week was much more lively than in London, there scarcely being one dull market. Many advanced fully 1s. per qr., as Hull, Rochester, Didcot, Lynn, Banbury, Chichester, Bristol, &c.; others were 1s. to 2s. higher, as Birmingham, Bury St. Edmund's, Gloucester, Dorchester, Dunstable, Luton, and Wolverton; and on Saturday the improvement was generally to this amount. Glasgow was 1s. per qr. higher, and Edinburgh firm. Native wheat at Dublin also advanced, and foreign well maintained its value.

On the second Monday there were fewer arrivals, both of English and foreign wheat. The number of samples sent up in the course of the morning was about an average, but so dense a fog prevailed up to half-past twelve that it was useless to attempt exhibiting them; and though during the latter part of the market there was more light, the spirit of buyers seemed to have failed so far as English qualities were concerned, and very little was done, though at former values. Some demand was, however, experienced for foreign, and full prices were paid. In floating cargoes no change was noted. The country markets were again more cheerful than the metropolis, and several noted a further improvement of 1s. per qr., as Wakefield, Spalding, Newbury, Rochester, and the majority of those held on Saturday. In Scotland there was firmness, and nothing more, Glasgow and Edinburgh not making a difference in prices. Dublin and other places in Ireland were fully as dear, but without activity in sales.

The third Monday opened on increased English and foreign supplies. Samples from Essex and Kent came to hand as usual, but a return of frost had stopped navigation, and nothing could be sold but what lay handy at the wharves or in granary: for these fully the previous rates were paid. The same impediments existing respecting the delivery of foreign, business was well nigh in a state of suspense, though prices were nominally at the previous range. No change was noted in the value of floating cargoes, there being very few on hand. The continued inactivity of London appeared this week to produce some effect on the country, where the markets were universally dull, and in a few cases rather lower, as at Liverpool, which declined 3d. per cental; while Newbury was reported 1s. per qr. down, and a greater decline was generally noted for inferior samples on Saturday. Glasgow and Edinburgh made no change, and it was the same with Dublin and several of the Irish markets.

The fourth Monday opened on small English supplies, with only moderate arrivals from abroad. The thaw then continued, with even an increase in the temperature. The fresh samples sent up in the morning from Essex and Kent were moderate in number, but in many of them the change to damp weather had done much mischief to the condition. Essex factors would have readily cleared their driest and best parcels by an acceptance of 2s. to 3s. less money, but most of them were unsold at the day's close; while for damp inferior lots no one would ask the price. Foreign was utterly neglected, though holders would have accepted 1s. to 2s. per qr. less money. In floating cargoes nothing was passing.

The imports into London for four weeks were 20,473 qrs. English wheat, 84,815 qrs. foreign, against 22,080 qrs. English, 17,465 qrs. foreign in 1866. The exports were 4,452 qrs. wheat, 1,125 cwts. flour for January this year. The general averages commenced at 60s., and closed at 62s. 3d.; those of London began at 65s., and closed at 66s. 2d. The imports for four weeks into the kingdom were 2,085,568 cwts. wheat, 341,321 cwts. flour, against 1,874,919 cwts. wheat, 614,726 cwts. flour in 1866.

The flour trade on the whole has been steady. On the second Monday town millers raised the top price from 57s. to 60s., at which it has since stood. Norfolks, and other qualities also, advanced 1s. per sack on the same day; but this was lost on the last Monday, when a general decline on wheat and other corn prevailed. It would seem that the French Government had influenced prices downwards at Paris, and to this interference with trade much of the depression must be traced. Prices on the last Monday were little more than nominal, as nothing whatever was passing. The imports into London for four weeks were 74,911 sacks country, 6,906 sacks 11,876 barrels foreign, against 93,917 sacks country, 5,570 sacks 13,904 barrels foreign for the same period in 1866.

The barley trade, which had been nearly at a stand-still in consequence of the frost, gave way 1s. per qr. for English and Scotch qualities on the last Monday; but there was little difference in the value of grinding foreign, as low 50lbs. per bushel American sold at 31s. 6d. on that day rather freely. This trade seems to have reached its height, and we have been surprised that prices should so long have been kept up. The imports into London for four weeks were 11,787 qrs. English, 65,104 qrs. foreign, against 16,368 qrs. English, 14,527 qrs. foreign for the same period in 1866.

The malt trade was steady up to the last Monday, when it gave way 1s. to 2s. per qr.

Business in oats has also been obstructed by the frost and impeded navigation. For the first three weeks prices kept at the former range; but on the last market day, the thaw being very decided seemed to give people an idea that navigation in the Baltic would soon be resumed, and good supplies be forwarded. This, however, is a doubtful matter, though prices then receded 6d. per qr. The imports into London for the four weeks were 14,694 qrs. English, 343 qrs. Scotch, 2,155 qrs. Irish, 147,287 qrs. foreign, against 11,221 qrs. English, 3,751 qrs. Scotch, 2,280 qrs. Irish, 47,417 qrs. foreign for the same period in 1866. The exports in January were 9,851 qrs.

Beans fared much the same as oats with regard to prices till the last market, when they declined 1s. to 2s. per qr.; but while the cold weather lasted, there was a good demand for granary samples, which has left stocks very small, and we should not be surprised to see some reaction in this grain, as but few are expected from Egypt or Algeria. The imports into London for January were 4,048 qrs. English, 3,471 qrs. foreign, against 6,092 qrs. English, 2,307 qrs. foreign in 1867.

A brisk enquiry was kept up for boiling peas during the severe weather, and retail buyers had to pay full prices; but with the thaw a languor came over the trade, and it closed about 1s. per qr. lower for all sorts. The imports for January were 2,774 qrs. English, 10,934 qrs. foreign, against 1,985 qrs. English, 8,421 qrs. foreign in 1866.

With small supplies of linseed, this grain has been firm all through the month, and as the frost went away, a demand for cake was renewed.

With small supplies of maize, this grain has been very firm, its use being now appreciated.

The seed trade has been in calm. Red cloverseed has not varied, nor canary or mustard. New spring foreign tares have arrived in plenty; but as yet there has been no demand for them: they are quoted 48s. to 50s. per qr.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

Shillings per Quarter.

WHEAT, Essex and Kent, white... old	62	73	...new	56 to	67
„ „ „ red ...... „	62	68	... „	54	65
Norfolk, Lincoln, and Yorkshire, red				52	65
BARLEY	34 to	37	Chevalier, new	41	53
Grinding	31	34	Distilling	39	41
MALT, Essex, Norfolk, and Suffolk			new	71	76
Kingston, Ware, and town-made			„	71	76
Brown			„	57	65
RYE				32	38
OATS, English, feed	24 to	30	Potato	27	35
Scotch, feed	24	30	Potato	29	35
Irish, feed, white	22	26	Fine	26	30
Ditto, black	21	25	Potato	27	32
BEANS, Mazagan	36	40	Ticks	36	40
Harrow	40	45	Pigeon	43	47
PEAS, white, boilers	40	41	Maple 39 to 40 Grey, new	37	38
FLOUR, per sack of 280lbs., Town, Households				55	60
Country, on shore	45 to	47	„	48	51
Norfolk and Suffolk, on shore				44	46

FOREIGN GRAIN.

WHEAT, Dantzic, mixed	61 to	64	old, extra	66 to	73
Königsberg	60	64	extra	66	68
Rostock	57	66	fine	66	68
Silesian, red	56	62	white	60	66
Pomera., Meckberg., and Uckermrk.			red old	59	65
Russian, hard,	52 to	58	St. Petersburg and Riga	55	61
Danish and Holstein, red				56	61
French, none			Rhine and Belgium	59	64
American, white 00, red winter 00 to 00,			spring	00	00

	Shillings per Quarter.	
BARLEY, grinding 29 to 31....distilling and malting	34	39
OATS, Dutch, brewing and Polands 22 to 31.......feed	21	27
Danish and Swedish, feed 24 to 29.... Stralsund...	24	29
Canada 22 to 25, Riga 24 to 27, Arch. 23 to 26, P'sbg.	24	28
TARES, Spring, per qr. ...... small 48 ...... large ...	50	00
BEANS, Friesland and Holstein	38	42
Königsberg ....40 to 43...Egyptian	40	41
PEAS, feeding and maple...37 39...fine boilers	38	39
INDIAN CORN, white......35 40...yellow	35	39
FLOUR, per sack, French..45 53...Spanish, p. sack	47	53
American, per brl.......27 30...extra and d'ble.	30	33

IMPERIAL AVERAGES

For the week ended Jan. 19, 1867.

Wheat	66,505¾ qrs.	62s. 3d.
Barley	52,303½ ,,	44s. 5d.
Oats	9,175½ ,,	23s. 4d.

COMPARATIVE AVERAGES.

	WHEAT.			BARLEY.			OATS.		
Years.	Qrs.	s.	d.	Qrs.	s.	d.	Qrs.	s.	d.
1863...	68,004⅛ ...	47	10	71,352¼ ...	35	0	12,926¾ ...	20	2
1864...	93,241 ...	40	10	74,271¾ ...	31	10	13,774⅜ ...	18	10
1865...	78,214¼ ...	38	10	75,753⅞ ...	28	9	9,855 ...	19	1
1866...	58,223½ ...	45	7	67,209½ ...	32	10	9,406⅛ ...	22	10
1867...	66,505¾ ...	62	3	52,303½ ...	44	5	9,175½ ...	23	4

AVERAGES

For the last Six Weeks:	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
Dec. 15, 1866..................	60	3	45	7	24	5
Dec. 22, 1866..................	59	5	44	4	25	11
Dec. 29, 1866..................	60	0	41	0	24	3
Jan. 5, 1867..................	60	2	43	6	24	2
Jan. 12, 1867..................	61	0	43	5	24	2
Jan. 19, 1867..................	62	3	44	5	23	4
Aggregate Average	60	6	44	2	24	4
Averages last year	45	7	32	10	22	10

PRICES OF SEEDS.

BRITISH SEEDS.

Mustard, per bush., brown 15s. to 17s. white	12s. to	15s.
Canary, per qr.....................................	58s.	68s.
Cloverseed, red.....................................	50s.	66s.
Coriander, per cwt..................................	18s.	20s.
Tares, winter, new, per bushel	5s. 0d.	5s. 6d.
Trefoil...	24s.	28s.
Ryegrass, per qr.	21s.	22s.
Linseed, per qr., sowing 68s. to 72s., crushing	66s.	70s.
Rapeseed, per qr....................................	58s.	62s.
Linseed Cakes, per ton....................	£11 10s. to	£12 0s.
Rape Cake, per ton..............................	£5 5s. to	£5 10s.

FOREIGN SEEDS.

Coriander, per cwt..................................	18s. to	20s.
Cloverseed, red 52s. to 65s., white..............	86s.	104s.
Trefoil...	20s.	24s.
Ryegrass, per qr.	18s.	20s.
Hempseed, small 38s. per qr., Dutch............	40s.	42s.
Linseed, per qr., Baltic 64s. to 68s...Bombay	69s.	70s.
Linseed Cakes, per ton.	£11 0s. to	£12 5s.
Rape Cake, per ton..............................	£5 0s. to	£5 10s.
Rapeseed, Dutch....................................	58s.	62s.
Carraway ,, ...	42s.	44s.

HOP MARKETS.

BOROUGH, Monday, Jan. 28.—Our Market has been very quiet during the past week. To-day we have had more inquiry, which, it is hoped, will lead to greater activity; but as yet no transactions of importance have taken place. Continental markets are without change. New York advices to the 15th instant report the hop-market as very strong, with an increasing firmness in prices; the stock on hand is now so inconsiderable as to lead to very general anticipations of higher quotations shortly.

Mid and East Kent	£8 10	£9 9	£11 11
Farnham and Country	8 10	9 9	11 5
Weald of Kent	8 8	8 15	9 5
Sussex..........................	8 4	8 8	8 15
Yearlings	5 5	6 6	7 10
Olds..............................	2 16	3 15	4 15

WORCESTER HOP MARKET (Saturday last),—With the change in the weather there is evidence of more disposition for business, but the quantity of hops put on offer is unusually small for this period, which restricts transactions. Planters are asking advanced rates, but without establishing any advance in values, so that this day's market may be written firm at our late currency,

POTATO MARKETS.

SOUTHWARK WATERSIDE.

Yorkshire Flukes	per ton	130s. to 160s.
,, Regents		110s. to 150s.
Lincolnshire Regents		110s. to 140s.
Dunbar and East Lothian Regents		130s. to 160s.
Perth, Forfar, and Fife Regents ...		110s. to 150s.
,, ,, ,, Rocks.. ...		100s. to 120s.
French Whites		100s. to 110s.

BOROUGH AND SPITALFIELDS.

LONDON, Monday, Jan. 28.—Although the weather has been more favourable, very few potatoes have been received fresh up to these markets. The trade for all descriptions is firm, at full prices. Last week's import was confined to 2 bags and 8 hampers from Rotterdam.

Yorkshire Regents	100s. to 116s.	per ton.
,, Flukes	130s. to 180s.	,,
Scotch Regents	110s. to 170s.	,,
,, Rocks	90s. to 120s.	,,

COUNTRY POTATO MARKETS.—Barnsley, (Saturday last): Best qualities of potatoes were rather cheaper, and were sold wholesale. Rocks 12s., Prince Regents 13s., and flukes 14s. per load; 1s. 2d. to 1s. 4d. per peck. Doncaster, (Saturday last): A good supply of potatoes, for which the demand ruled brisk. Wholesale 12s. 6d. to 14s. per load of 18 stone; retail 1s. 2d. to 1s. 4d. per peck. Manchester, (Saturday last): Potatoes 10s. to 16s. per 252 lbs. Pontefract, (Saturday last): Potatoes 1s. 3d. per score. York, (Saturday last): Though there has been a slight return of frost, it has not prevented supplies from coming to market to a much greater extent than had been the case for the past few weeks. The wholesale prices were 12s. to 13s. per 280 lbs.; retail 1s. per peck.

ENGLISH WOOL MARKETS.

CITY, Monday, Jan. 28.—We have no quotable change to notice in the value of any kind of wool. Home buyers continue to operate with great caution, and the transactions for export purposes are very limited. The forthcoming public sales of colonial wool to be held in the metrepolis are looked forward to with much interest.

Current Prices of English Wool.		s. d.		s. d.
Fleeces—Southdown hoggets............	per lb.	1 7½	to	1 8½
Half-bred ditto	,,	1 9½		1 10½
Kent fleeces.........................	,,	1 8		1 9
Southdown ewes and wethers	,,	1 7		1 8
Leicester ditto	,,	1 7		1 9
Sorts—Clothing	,,	1 6		1 10½
Combing	,,	1 6½		2 0

LEEDS (English and Foreign) WOOL MARKETS, (Friday.)—The demand for English wool is restricted to the actual necessities of the manufacturers, and prices of some sorts are in favour of the buyers. There has been no improvement in the demand for colonial and other clothing wools, and sales have been below an average. Prices have not undergone any material change.

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano direct from the importers' stores, £12 5s. to £12 10s. per ton.
Bones, £6 to £6 5s. Ditto Crushed, £6 10s. per ton.
Animal Charcoal (70 per cent. Phosphate) £5 per ton.
Coprolite, Cambridge, whole £2 10s., ground £3 to £3 2s. 6d. per ton.
Suffolk, whole £2 to £2 10s., ground £2 10s.
Nitrate of Soda, £12 5s. to £12 10s. per ton.
Gypsum, £1 10s. Superphosphates of Lime, £5 5s. to £6 5s. per ton.
Sulphuric Acid, concentrated 1·845 1d. per lb., brown 1·712 0¾d.
Blood Manure, £6 5s. to £7 10s. Dissolved Bones, £6 15s. per ton.
Linseed Cakes, best American brl. £12 to £13, bag £11 to £12 10s.
Cotton Seed Cake, £6 15s. to £7 10s. per ton.

E. Purser, London Manure Company,
116, Fenchurch Street, E.C.

Guano, Peruvian	£12 7 6	to £0 0 0		Linseed Cake, per ton—		
Do. Upper do.	6 15 0	7 0 0		Americ., thin, bgs.	£10 10 0	to £10 15 0
Malden Island	0 0 0	0 0 0		Do. in brls.........	0 0 0	0 0 0
Bone Ash...	4 7 6	0 0 0		English............	11 0 0	11 10 0
Brimstone, 2d&3rd	0 0 0	0 0 0		Cotsd. Cake, decort.	0 0 0	0 0 0
Saltpetre, Bengal,				Linsd. Bomby, p. qr.	3 10 0	3 12 0
2 per cent.	0 0 0	0 0 0		Rapeseed, Guzerat	2 17 0	2 18 0
Nitr. of Soda, p. ct.	0 10 6	0 11 0		Niger....................	0 0 0	0 0 0
Cloverseed, N. Am.				Tallow, 1st P.Y.C.	2 6 0	2 7 0
red, new per cwt.	2 15 0	3 0 0		,, super. Norths	2 5 0	2 5 9

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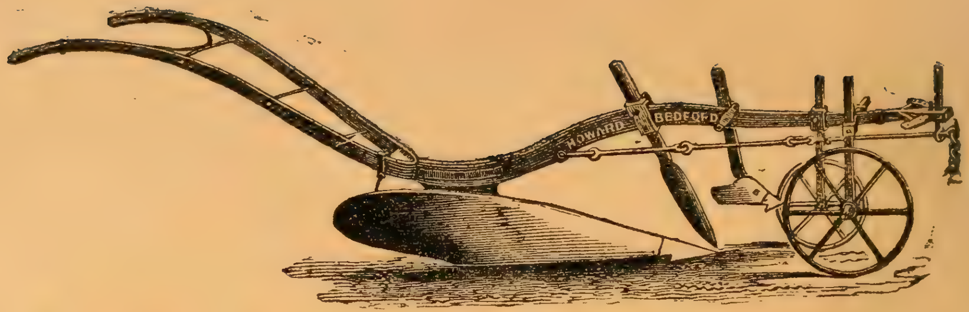

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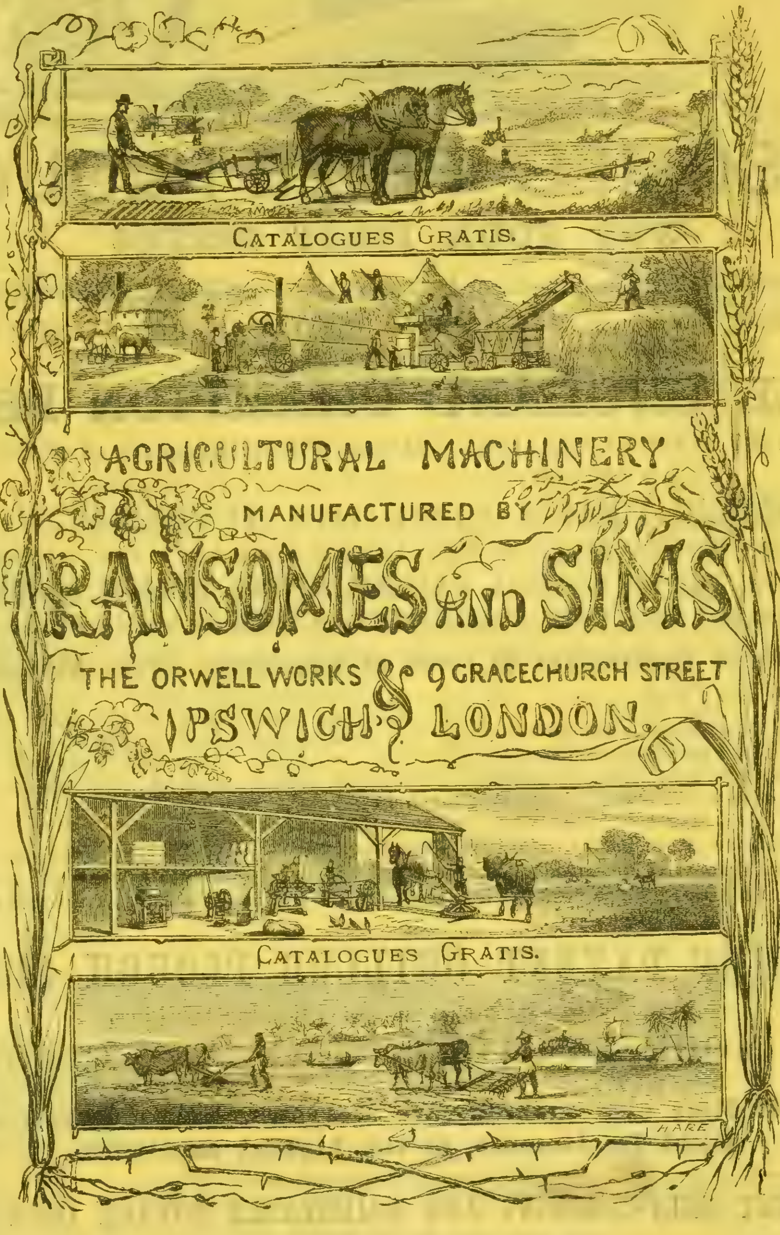

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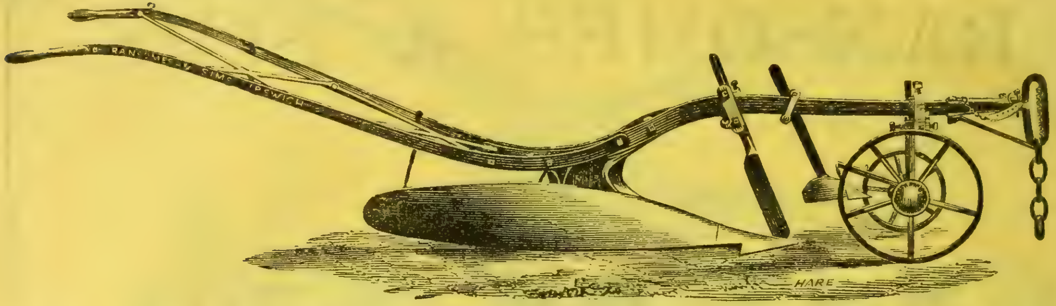

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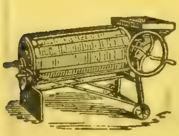

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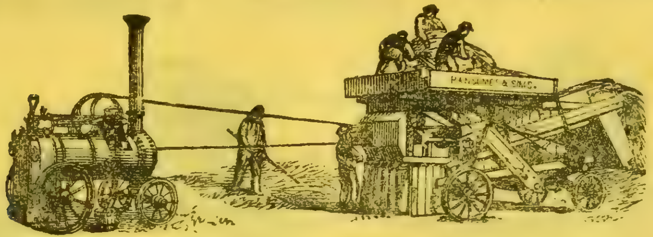
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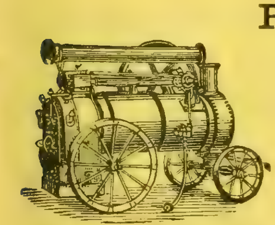
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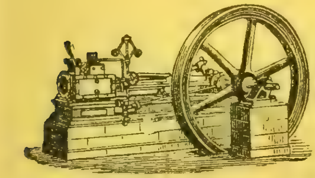

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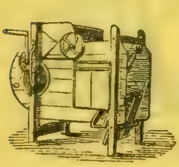

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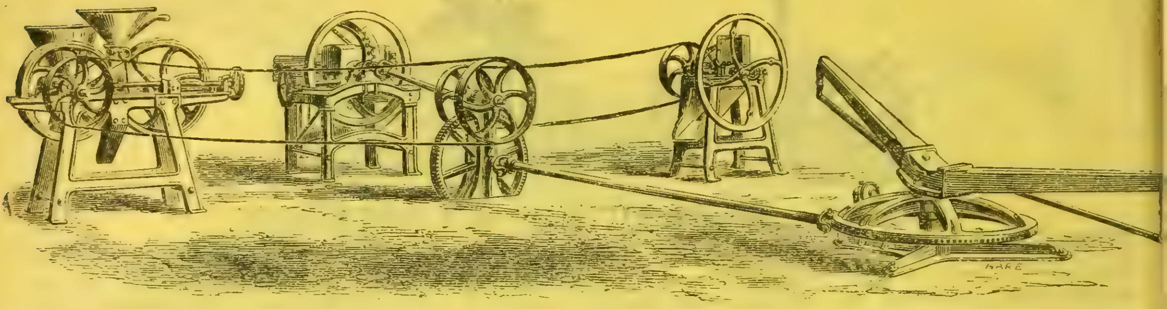

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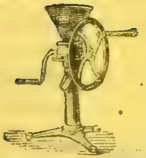

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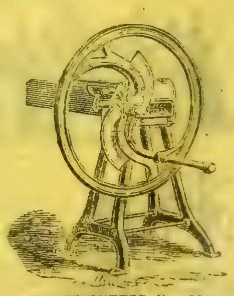

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In Middle Park.

[illegible]

THE FARMER'S MAGAZINE.

MARCH, 1867.

PLATE I.

SOUTHDOWN WETHERS.

THE PROPERTY OF LORD WALSINGHAM, OF MERTON HALL, THETFORD.

At the Smithfield Club Meeting, in December last, the Merton flock quite recovered its pre-eminence, Lord Walsingham taking the first prizes in two of the classes, and a second in the other; his shearlings also winning the silver cup, as the best pen of short-wools in the Show. On our first glance over the pens we thus spoke of the merits of these entries: "With the sheep there is another strong lead, that is amongst the prime West-end sorts, as we take the Southdown to hold much the same rank amongst sheep that the Devon does amongst cattle. The two shearling classes were never better; for Mr. Moore, on the part of Lord Radnor, admitted to never having made up any pen superior to these, if they could only finish third; the Merton flock, as it will be found, having regained its supremacy, and certainly truer sheep have seldom been seen." Lord Walsingham beat, in these two younger classes, Lord Sondes, Lord Radnor, Mr. Foljambe, Mr. Rigden, and Mr. Penfold.

Two of these Cup Shearlings were by the second prize ram at the Royal Show at Newcastle, in 1864, and the other wether is a half-brother of the first prize ram at Newcastle.

The following statistics speak well to the healthy and prolific qualities of the Merton flock. At the meeting of the Wayland Agricultural Association, in the autumn of last year, the first prize for shepherds was awarded to Charles Crane, shepherd to Lord Walsingham, for rearing 609 lambs from 415 ewes, with the loss of 6 ewes; the number of live lambs being taken on the 1st of June, 1866, and the number of ewes in November 1865. Moreover, of the seven rams used over these ewes, six had been distinguished at the Royal Meetings; two as first prize sheep, one as a second prize, one as a third prize, and the other two highly commended. This goes to prove that show sheep may get plenty of healthy lambs when properly reduced again, and judiciously used.

PLATE II.

IN MIDDLE PARK.

ELSPETH, DEFENCELESS, AND TYPEE.

These mares, with their foals alongside, were grouped together in Middle Park last summer, and the produce are consequently now amongst the yearlings coming on for sale at these famous anniversaries.

The handsome blood-like chesnut mare, and as beautifully bred as she looks, is Elspeth; purchased by Mr. Blenkiron at the sale of the late Mr. Greville's mares in the summer of 1865, with a colt foal by St. Albans at her foot, and stinted to him again, for 650 gs. Elspeth, bred by Lord Eglinton, in 1850, is by Irish Birdcatcher, out of Blue Bonnet (winner of the St. Leger), by Touchstone; her dam Maid of Melrose by Brutandorf – Whisker —Orville. Birdcatcher, by Sir Hercules out of Guiccioli, by Bob Booty, died in March, 1860, aged 27. Elspeth on being taken out of work went at once into Mr. Greville's stud, where she began well; her first foal, in 1854, being Drumour, a winner of the July, by Big Jerry or Weatherbit; while in 1856 she threw Telegram to Alarm, and in 1857 Refugee to the same sire. Since then she has been served in turn by Voltigeur, Alarm, and St. Albans, her colt by St. Albans, now called St.

Ronan, making 2,000 gs. at the last Middle Park sale; so that Mr. Blenkiron soon turned the purchase-money with even something more beyond the mare to show for it, in an own sister to St. Ronan, which will figure in the next catalogue, and that is said to be better looking than her brother. Elspeth is this season in foal to King John.

Defenceless, the old blind mare in the centre, is renowned as the dam of Caractacus, a winner of the Derby. She was bred by Mr. W. Etwall, in 1844, and is by Defence, her dam by Cain out of Ridotto, by Reveller—Walton. Defence, by Whalebone out of Defiance, by Rubens, was shot at Bridekirk, in September, 1848, aged 24. On going to the stud, Mr. Etwall kept her for three seasons, during which time she threw Lamia and another filly to Venison. She was afterwards for four seasons in the same district with Mr. Waters, where she was credited with two unnamed and unknown fillies to Thistle-whipper, a colt called Haunch of Venison, as afterwards Golden Slipper, to Venison, and a colt by Bay Middleton, that met with an accident. Mr. Blenkiron bought her in 1854, in a lot which also included Triangle, the dam of Problem; Odessa, the dam of Flax; and Empress, the dam of Autocrat. In 1854 her produce was a filly, called Reconciliation, also by Bay Middleton; while in the four years following she stood regularly to Kingston, Vindicator being dropped in 1856, a filly in 1857, a colt in 1858, and Caractacus in 1859. She had a filly by Neasham in 1860; another by Marsyas that died a foal in 1861; a colt by the same horse in 1862, Montrose by Dundee in 1863, a filly by Marsyas in 1864, a filly by Dundee in 1865, and another filly by the same horse in 1866, now coming on. The own sister to this made 420 gs. last summer, the Marsyas filly 700 gs. at the sale in 1865, and Montrose 700 gs. at that in 1864; but the crack, Caractacus, went easy enough to Mr. Snewing for 260 gs. Defenceless is also in foal to King John.

Typee, the best known mare of the three, leads the party with her foal at her head. She was bred by Lord Stradbroke in 1850, and got by Touchstone out of Boarding-school Miss, by Plenipotentiary; her dam Marpessa, by Muley. Touchstone, by Camel out of Banter by Master Henry, died in January, 1861, aged 30. Never appearing until well on as a three-year-old, Typee ran on to the end of her sixth year, during which time she started 37 times and won 14. Typee's first foal, called Lord Chesterfield, and by Voltigeur, was subsequently sent to Hungary. He was dropped in 1859, and at the sale of some of the Bretby Stud, in the November of 1860, the mare was knocked down when barren to Mr. Blenkiron, for 300 gs. Her next produce was a filly, Nukuheva by Neasham in 1862, Mazeppa by Wild Dayrell in 1863, a colt (dead) by Rataplan in 1864, a colt by Stockwell, sold for 1,000 gs., in 1865, and a colt by Weatherbit in 1866. This was a late foal, born on May 16th, and consequently not so forward as some of the others; though for power and quality combined, Mr. Blenkiron considers him the best of the year's produce. Typee is in foal to Saunterer.

The Middle Park stud was commenced in 1854; and the first mare ever purchased by Mr. Blenkiron was Glance, by Venison, still in his possession, and now in foal to Amsterdam. The first stallion was Neasham, a son of Hetman Platoff; and the first sale of yearlings took place at Tattersall's, in 1856. Subjoined is a summary of the results:

Year.	Lot.	Total. £.	Average. Gs.
1856	13	1,407	108
1857	23	2,691	117
1858	22	2,194	100
1859	28	2,396	104
1860	34	3,985	127
1861	37	9,559	258
1862	33	7,746	235
1863	41	7,917	193
1864	43	11,855	257½
1865	45	14,401	320
1866	42	19,120	455
1866 (2nd sale)	22	7,075	321½

Thus in eleven years 383 thoroughbred yearlings have been reared at Middle Park, the public sale of which has realized 90,326 gs., at an average of over 235 gs. each.

OUR POULTRY.

BY CUTHBERT W. JOHNSON, F.R.S.

Considerable discussions have recently taken place upon the deficient supply obtained from our poultry yards. Numerous inquiries have been instituted as to the profitableness of poultry rearing. One or two public companies have been formed for breeding chickens on a large scale. The practice of our Continental neighbours has been examined, and some valuable reports have appeared on these heads. It is indeed a rather remarkable fact that the poultry rearers of the Continent not only supply their country with poultry and eggs to a far greater extent than in our islands, but that they are also able to spare us a very large amount, both of poultry and eggs. Only take the last year's official return of the imported poultry and game—that for the year 1865 (*Farmers' Almanac*, 1867, p. 25). In that year the declared value of these was:

From France (chiefly poultry)	£64,532
„ Belgium (chiefly rabbits)	70,653
„ Norway (white hares and ptarmigan) ...	2,556
„ Holland	9,993
„ Other countries	1,408
Total value	£149,142

Then as to eggs. There were imported into our islands in that year 364,013,040, the number in the previous year being 335,298,240. And this import has long been steadily increasing; for, as Mr. J. A. Clarke truly remarks in his very interesting paper "On increasing our home production of poultry" (*Jour. Roy. Ag. Soc.*, n. s., vol. ii., p. 338): "We do know that the demand for birds, for eggs, and feathers greatly exceed the home supply; and that, so far from overtaking the appetite of the people, our poultry keepers permit an ever-increasing importation to confront them in their own markets. Thus the annual import of eggs from the Continent averaged 73,000,000, from 1843 to 1847; it averaged 103,000,000 during the next five years; 147,000,000 for the next five years; and 163,000,000 for the next five years. In 1861 we received from abroad 203,313,360 eggs; in 1863 the number was 266,929,680; while in 1865 it amounted to 364,000,000—that is, about a million eggs per day! The average price fixed at the Custom-house for the computation of the real value of the eggs, it is added, was in 1854 4s. 6d. per ten dozen; but owing to the rise in price since that time, they have been reckoned for the last six years at 6s. per 120, which is also the wholesale price in France. At this figure we must have imported last year no less than £910,000 worth of eggs. This year the value will most likely exceed a million sterling. With regard to birds, the Board of Trade returns have not noticed them since 1856; but for that, and the previous two years, we received in value as follows: £38,876 in 1854, £42,075 in 1855, and £48,230 in 1856. There is good reason for believing that this increase of about 25 per cent. in three years has been maintained; and if so, the importation in 1865 was something like £90,000. [We have already seen that it was £149,142 in 1865.] Adding this to the £910,000 for eggs, it appears that there was landed on our shores last year a million pounds' worth of produce that we could have raised with the greatest ease in our own country; while every year is telling more and more to our discredit. That sound and searching authority, M. de Lavergne, in his 'Rural Economy of England,' &c., made an approximative estimate of the number and value of our birds, setting down the annual production of the United Kingdom at £800,000; and if this be anything near the truth, then, allowing for an increase of production in the ten years since Lavergne wrote, we are now actually importing a total of poultry and eggs equalling in value all that we rear and feed at home! Cannot we just double our results, and thus keep in our own hands the sum of over £1,000,000 a-year, which we are at present paying to France, Holland, Belgium, Switzerland, and Italy? Cannot we compete with foreigners under the disadvantage of having to convey their fragile and perishable commodities over long journeys and voyages, with the expense of commission agents at the distant market, and a duty of a penny a-dozen levied upon their eggs?"

In considering these interesting queries we must not forget that in France the poultry-rearers are commonly very small farmers, who make it a business, and that poultry-rearing is there often carried on by the aid of three classes, viz., those who hatch, those who rear and fatten, and those who kill and truss them for market—a class of persons who are not yet existing with us. It must not, however, be concluded, as is sometimes the case, that the climate of France is better adapted than our own to the breeding of poultry. In that empire the winter and spring chickens are all reared in outhouses; for, as it is observed, "certainly the French chickens enjoy no balmy climate, congenial soil, or other physical favour that may be denied to tender broods in Britain. 'In France, as here,' says M. Geyelin, 'a cold or wet spring is equivalent to a great loss in poultry, and it seems to be admitted everywhere that cold and wet do not agree with poultry; therefore, were it not for some novelties I observed in the rearing, I might well have said that their system is no better than our own; in fact, they show an utter disregard of all sanitary considerations, and I may state that even the best-conducted establishment left room for great improvement in this respect.'" The French fatteners have, it seems, a wretched notion that fowls feed much quicker without light or ventilation, and without their excrements being removed, from which cause their places are most offensive and unhealthy. They told M. Geyelin, that "they were quite sure that the smell of the excrements stimulated the fattening." When we are feeling disgusted at this notion of the French poultry keepers, we may usefully remember that it is a very general conclusion, in some rather dark portions of our islands, that hen-houses rarely need cleansing, and that pigs thrive best when their sty-yards are deeply covered with filth. And then, as regards our poultry-houses, how closely does the description of those of our country too often resemble that of the Parisians described by Mr. P. H. Frere (*ibid*, p. 21). He tells us that in the first place their fowls are often ill-lodged. Every transplanted "cit" dreams of new-laid eggs; but it is only after providing for flowers, vegetables, and fruits that the Parisian who buys land by the foot asks himself, "How shall I house the hens?" After a search he discovers some corner where plants will not live for want of air and sun, and there he sets up his trellis, painted bright green in cruel mockery. "How many of these dens," writes M. de Chavanne, "did I come across in a three months' quest of a home! How many victims did I behold, who, with one leg in the mud, and the other buried in the breast-feathers, invoked the cook's knife to put an end to their misery! Poultry must have space, air, and sun, or the balance-sheet will tell a sorry tale."

The next source of mischief is an aspiration after fancy poultry of various kinds, often selected for eccentricities in plumage. From such a jumble of races this alone can be foreseen—that the produce will *not* be good layers and ready fatteners. The feeding too is often mismanaged. In a suburban establishment the poultry gets overlooked; and, if the corn is given with regularity, the water-trough is often empty, or, even in a well-ordered establishment, a supply of "greens" is overlooked, or the indispensable box filled with ashes or sand—the fowl's only resource against parasites—is withheld.

It was in 1864 that a grand poultry show was held in Paris, and at this meeting 2,500 head of poultry were exhibited, all killed, and prepared for cooking. At this meeting great pains were bestowed in ascertaining the relative cooking properties of the three great poultry breeds of France, viz., those of La Bresse, Houdan, and of Normandy (Frere, *ibid* p. 81).

Five specimens were selected from each of the three rival breeds for special comparison, and were weighed before and after being prepared for the cook, and also when roasted. An experiment to show the comparative waste from roasting in the open air, or "brazing," that is, cooking in a covered vessel, had been contemplated, but I do not find a record of any such results.

The *average* weight of these lots were as follows:

	La Bresse.		Houdan.		Normandy.	
	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.
Unprepared	6	12	5	4	4	11
Prepared for the cook	5	5½	4	3	3	14
Dressed (après la cuisson).	3	3¾	2	15¾	2	12½

Or, more precisely, the loss per cent. was as follows:

	La Bresse.	Houdan.	Normandy.
In preparing for cook	20.98	20.32	17.58
In cooking	40.68	28.83	28.42

The advocates of La Bresse would remind us that the greater loss in their fowl is not to be set down as pure waste, as there is probably a greater amount of gravy, which has a certain value.

The Normandy chickens are stated by M. de Kergolay to have been younger than their rivals, and on that account to have lost less weight, since the fatting process had not been carried so far in their case. But the Houdan breed are also very precocious, those hatched with the new year being ready for market by the middle of April, after three weeks of fatting on barley-meal moistened in milk, "bolted" three times a-day without drink, the cost of food being 1s. to 1s. 3d. These chickens are reared among woods, where they are to be seen picking up much insect food, and kept in droves of 300 or 400. They are mostly hatched under hen-turkeys.

The food of their poultry is very carefully regarded by the French breeders. "For the first week after being hatched," continues Mr. Clarke "(and in winter for a much longer time) the chickens are fed on barley-meal mixed with milk, stale bread soaked in water, and green food finely chopped. M. Geyelin did not, in his researches, find a single instance of poultry being fed upon whole grain: 'On inquiring the reason why they fed on meal made into a stiff paste, I was informed that whole grain would be too expensive, produce less eggs, too much fat, and cause more disease when fowls are fed *ad libitum*, so as to completely fill their crop, which renders the digestion difficult. The food is mostly composed of about one-half bran, one-half buckwheat, barley, or oatmeal, made into a stiff paste, with which the fowls are fed twice a day, namely at sunrise and sunset. This diet is given indiscriminately to old and young. In some farms, where the poultry have not the run of meadows, they are provided with a certain amount of animal and vegetable food.' At one establishment all the waste of a butcher's shop is obtained at the expense of collecting it; this is boiled, the fat is skimmed off, and when coagulated, finely mixed with the waste, and mixed with the meal food. The liquid is utilized by boiling in it cabbage-stalks and other kitchen-garden waste, mixing it with bran, sour poultry-food, &c., and then giving it to pigs, which 'thrive admirably on it.' Buckwheat is considered preferable to all other grain as a stimulant to egg laying, and in winter a certain amount is given whole.

"Whilst the rearing is carried on by farmers, the fattening forms quite a special trade, chiefly in the hands of cottagers, who purchase the chickens either from farmers or in the market; moreover, it is the exclusive trade of a few villages in each poultry-breeding district, such as Goussainville, Saint Lubin, La Haye, &c., near Houdan; Villain and Bouce, near La Flèche au Mans: also some hamlets near St. Pierre Divé, Lizieux, Calvados. In these localities, however, the system of fattening differs. The one consists of liquid-cramming with barley-meal and milk, given by means of a funnel introduced into the throat of the fowl three times a day. This process is exceedingly expeditious, as one person can easily cram at the rate of sixty fowls per hour; and the fattening lasts from fourteen days to three weeks, according to the disposition of the chicken to take fat. The selection of the stock requires some judgment, as some chickens are constitutionally too weak, and others have not the frame to receive fat. This system of liquid-cramming is principally adopted in the neighbourhood of Houdan." The use of fat for fattening purposes is deprecated, as it deteriorates the fineness and flavour of the flesh. "In the districts of Le Mans and Normandy, the fattening is performed by dry cramming, namely, the meal of barley and buckwheat is made into a stiff paste with milk and water, then formed into pills two inches long and half-an-inch in diameter; these are dipped into water, and forced into the throat of the fowl until the crop is filled, twice a day. It is, however, of importance not to cram a fowl until she has digested the previous meal, as otherwise it might produce inflammation and death."

As we have before remarked, the killing and dressing of poultry is quite a business in the great poultry districts of France. It is thus described (*ibid.* p. 351): "The killing and dressing also is a speciality, carried on by men called *Tueurs et Appreteurs*, the factory system of division of labour being thoroughly applied to the whole of poultry-craft. 'They are astonishingly expert in their business, and unless witnessed, as we have done, it would appear incredible that one man can kill and pluck at the rate of one fowl per minute, or sixty per hour. The price paid for this work is about one farthing per head for lean, and one halfpenny for fat poultry. The system of killing differs, however, in this, that whilst in Paris they make a gash in the throat, in the country they stick the poultry in the back of the roof of the beak; both cause immediate death, but the latter is the cleanest and most desirable process. They deprecate our system of twisting the neck as cruel, discolouring the flesh, and causing early putrefaction of the coagulated blood. When a man kills, he has three baskets near him, into which he drops the feathers, according to the size; and the reason for plucking the fowls immediately after death is the great saving of time, and the prevention of tearing the skin, which cannot well be avoided when the fowl once gets cold. The lean fowls are immediately emptied of their intestines; but not so with the fat stock, which contain a large quantity of valuable fat, used in basting, and to give flavour to lean poultry. With chickens, they take care to leave the down on, as an index of their age; and in all fowls they leave about half-a-dozen feathers in the rump, which gives a very pretty appearance. As soon as the fowl is plucked, and before cold, it is laid on its back on a bench, and wrapped round with a wet linen cloth to mould its shape, and to give the skin a finer appearance. However, they use no flour, as with us, to give an old hen the appearance of a chicken.' The fat poultry is drawn and dressed by cooks, who make an incision under the leg to withdraw the intestines, so that the bird is not disfigured. 'The feathers are carefully collected and sorted, and when well dried, sold to dealers. The intestines are boiled, the fat skimmed off, which is sold separate. The intestines are then minced as food for poultry, and the liquid is used for feeding pigs. The combs and kidneys are sold to pastry-cooks, the first for decorating, and the latter for flavouring pies. The heads, necks, and feet are sold to hotels, restaurants, &c., for flavouring sauces, or boiled down to make chicken jelly."

The great question after all is yet to be examined, viz., does poultry-keeping answer commercially? We rather incline to the opinion that it shares the fate of all other professions, viz., it is profitable when carried on carefully and skilfully, but that it must be commenced with great care, a selection of pure good breeds, incessant attention to food, shelter, and cleanliness, and thus by degrees a practical knowledge of the business is acquired, which is commonly called "skill." It is idle for the careless and indifferent to hope to succeed. These facts are thus alluded to by M. Dubost, when descanting upon a favourite French breed, that of La Bresse (*ibid.* p. 87):—

"All do not succeed alike even when favourably circumstanced, for certain families and farms enjoy a special reputation; but success generally depends on having the breed quite pure. Cross-breeding has been tried at various times to increase the size or improve the quality of the race, but these attempts proved failures. When a cross with the far-famed Cochins was tried, there was a gain in size, but a loss in delicacy and flavour, so that this cross is now quite interdicted. 'Any fowl that shows the least sign of cross-breeding by a yellow tinge, or even by having scales on the legs, loses at once one-fifth or one-sixth of its value at market. These attempts have served at least to establish the value of the breed, and the importance of maintaining its purity.

"In short, their delicate mould, early maturity, and readiness to fatten, make them the Shorthorns of the poultry-yard, with this advantage over their bovine rivals—that the quality of the flesh is first-rate, as various renowned epicures have testified. Until lately the poultry of La Bresse was little known or appreciated at Paris, though for forty years it has been exported to St. Petersburg.

"The breed is hardy, and will adapt itself to all parts of France. But the fatting trade is not so accommodating. To ensure success not only the pure breed and the proper food (white maize and buckwheat) must be procured, but the skill and the habits handed down from one generation to another among the farmers of La Bresse must be naturalized and followed up."

When poultry are kept upon a large scale the value of the manure must not be disregarded in the calculation of profit and loss. In France this fertilizer is eagerly bought by the market gardener. It abounds with phosphate of lime and ammoniacal matters. M. Vauquelin, a celebrated French chemist, long since made an experiment on the subject, by feeding a hen for ten days with 11,111 grains of oats. During this time the excrement emitted contained 175 grains of phosphate of lime. Its composition of course varies with the food of the hen. The dung of the pigeon, as imported from Egypt, was found by the late Professor Johnston to contain 59.68 per cent. of organic matter, 1.50 of ammonia, and 7.96 of the phosphates of lime and magnesia. The excreta of birds fed partially on animal matters is of course the more valuable.

Upon the whole, the reader will probably incline to the opinion that, in the hands of those who will, in suitable districts, earnestly and carefully bestow the requisite time to the business, the breeding, rearing, and fattening of pure breeds of fowls may be profitably and largely increased; and thus a very considerable addition be made to our present insufficient supply of animal food.

STEAM CULTIVATION.

BY WILLIAM BULSTRODE, OF MOUNT FARM, COOKHAM DEAN, BERKS.

The object of the present papers is essentially a practical one. I propose first to put forward in a clear and intelligible form the advantages and profit to be derived from steam cultivation; secondly, to place before my readers such remarks on the comparative merits of different systems of steam cultivation as may assist them in making their choice; and thirdly, to offer such hints and advice on the practical working of steam machinery as my own experience suggests. In doing this, I shall address myself to the great body of practical farmers who have hitherto neglected to encourage a real friend, under the erroneous impression that he might prove to be only a boasting impostor. Probably the exaggerated statement of theoretical or over-enthusiastic supporters have had much to do with this; but the time has now come when steam cultivation can be judged on its own merits, and compared with the ordinary system of cultivation with horses.

Part I.—On the Importance and Value of Steam Cultivation.

One great cause which has operated with many of our best farmers, in preferring horse cultivation to steam, has been the consciousness of their want of knowledge of the science of mechanics; they dread lest expensive breakages and general failure should result from the injudicious use of a machine, the parts of which they understand so little. This fear, though possessing a certain amount of force, has been allowed to go much too far. There is nothing in the adoption of steam cultivation which need alarm any farmer of common sense and practical knowledge. Attention to simple, general rules, within the compass of any mind of ordinary intelligence, will enable the farmer to superintend and manage steam cultivating machinery as well as, and his farm a great deal better than, a trained engineer. Certain difficulties in the way of adopting steam cultivation I shall refer to more at length hereafter; such, for example, as want of capital, uncertainty of tenure, small size or hilly nature of the farm, and want of a good water supply; but if its value is really understood and appreciated I do not think much difficulty will be experienced in overcoming the obstacles which lie in its way.

The first thing for the farmer to do is to satisfy himself whether or not the cultivation of his land by steam is really cheaper than its cultivation in the ordinary way by horses. Now, the three essentials for good farming are condition, cultivation, and cleanliness; and steam cultivation must be regarded, generally, as the means of obtaining the two last, viz., cleanliness and cultivation, and as a friendly auxiliary to, not a substitute for, the other essential, viz., manure. It is true that in some cases, especially on wet land, steam cultivation may greatly increase the produce without a corresponding increase in the manure applied by enabling the manure and the productive elements of the soil itself to come into work; but, as a rule, if we look for steam cultivation to impart condition, and, on that account, neglect to manure, we shall seek in vain for satisfactory results. By keeping this clearly in mind we shall be in a better position to calculate the value of steam cultivation as applied to its legitimate and true use, which is the cheaper and more efficient mechanical cultivation of the land.

Now, it has been established on reliable authority that the relative cost of horse and steam labour is very nearly in the proportion of three to one; or, in plain words, work, which if done by steam, costs £1, will, if done by horse-power, cost nearly £3. Of course this applies only to *mere* labour, for there are many purposes to which the steam is inapplicable, and to which it is, therefore, more economical to apply the expensive horse-power, or even manual labour, which costs about forty-six times as much as steam; such, for instance, as in working narrow slips, irregular patches of ground, or in digging corners, and anywhere, in fact, where intelligence or adaptation to varying circumstances is required; but still the great fact is before us, that *if* steam-power can be applied directly to the heavy, or other operations of the farm, a saving of nearly two-thirds of the cost is effected; and when we remember that, at the present time, steam-power is applied on hundreds of farms, in this country alone, to such operations as ploughing, cultivating, drag-harrowing, and even to drilling, we shall see that the above statement is no matter of idle theory, but a practical and most important one.

This being understood, we shall proceed to the consideration of certain other advantages possessed by steam over its rival horse-power. First, then, we must feed and tend our horses whether they are at work or lying still—on Sundays, on wet days, and through long periods of frost. The steam-engine needs food only while at work.

On wet farms this costly feeding of horses is especially felt when the weather day after day will not allow a horse to go on the land, although the work to be done is accumulating; consequently a greater number of horses than would be otherwise needed must be kept, in order that the lost time may be made up for, when a favourable change comes. When, again, this favourable season does come, little overtime can be made; nature must have its accustomed period of repose, and the horses must come to their stable at their regular time, although four or five hours of daylight yet remain. Not so with the steam-engine: we can afford to let her lie still, because she costs us nothing for food when idle; and when the weather is fine, and the land in good working order, we can press on vigorously as long as the day lasts. The engine eats and drinks as she works, and asks for nothing when her work is over. The importance of this ability to push work rapidly forward at the proper time can hardly be over-estimated.

I will next refer to the injurious effect of treading on clay soils, by which the subsoil is often so completely puddled as to defy all efforts of the roots to extract from it the requisite nourishment; and this drawback is in some seasons so serious in the case of land which has undergone a costly draining, that the labour and money so expended are almost thrown away in consequence of that same puddling of the subsoil, which compels the water to run scouring down the furrows, carrying with it the manurial ingredients with which it is laden, instead of percolating through the soil and leaving its treasures for future crops. If we compare, or rather contrast, the work accomplished by a team of four or perhaps five horses travelling laboriously and slowly over the heavy clay, and coming into the stable jaded and beaten out while the afternoon has hardly opened upon them, with the steady and regular process of the steam-plough or cultivator, stirring deeply and effectively, without treading, and without fatigue, the rich but sadly ill-treated clays, we cannot be in any doubt as to the advantage of steam-cultivation as regards the cost of the work done, and still more as to the value of that work. It does, I confess, astonish me, how any man can go on year after year cultivating a tenacious but well-drained clay farm with horses only, when he has at his command such an invaluable and trusty friend as the steam-cultivator.

I have dwelt particularly on clay lands, because it is on these that the advantages of steam cultivation are most manifest. On light lands the lost days are comparatively few, the treading seldom injurious, and sometimes beneficial; but if these special reasons are wanting, there are other advantages which they share in common with the heavier soils, the consideration of which will prove the wisdom of adopting steam as an auxiliary.

For cleaning light land of couch, the steam cultivator affords facilities which no ordinary amount of horse strength can do. As soon as convenient after harvest, the ground can be rapidly shattered by a quickly moving and suitable implement, the couch torn to the surface, instead of being cut to pieces, and buried by that "filth planter," the plough. Drag-harrows, worked either by steam or horses, can follow immediately, and lighter harrows, rolls, and chain-harrows, worked by horses, complete the work in a satisfactory manner while the weather is fine and dry. To the farmer who has entered, or is about to enter upon, a farm abounding with couch, the steam cultivator is invaluable; but when employed for this purpose, it must be used judiciously and vigorously. As soon as the opportunity offers, the united labour of steam, horses, and men must be concentrated upon the land, with this one conviction, that a foul farm quickly cleaned is, and must be, cheaply cleaned.

For deep and thorough cultivation steam power possesses great advantages. How often does the dread of "losing our season" interfere with deep ploughing under horse culture! An extra inch or two in depth involves so much extra time, that we are willing to content ourselves with shallower work, lest we should get behind with our drilling; but with steam power we can rely with tolerable certainty on the time required for deeper work, because the days for steam work are so much longer, and the extra time required so much less. Hence we are led to conclude that on light land we have in the steam cultivator a far better means of cleaning the land, and therefore a far cheaper one; and we have the means of cultivating our land more thoroughly, and to greater depth, with little loss of time.

Whether, however, we refer to heavy land or to light, one especial advantage of steam is the facility it affords for autumn cultivation. The want of this has long been recognised by practical men; but other work of paramount importance has obliged us very often to defer the work of cleaning our stubbles until the spring, when the power of vegetation is most vigorous, and when the delay of a few weeks from wet weather brings on a long and continuous line of spring-sowing which cannot be neglected. The wheat-sowing must be attended to in the autumn; the sowing of beans, oats, and barley must have our attention in the spring; and so the operation of thorough cleaning gets put off from autumn to spring; and, at last, the wurzel, swedes, and turnips are too often put in as well as we can, but very far from as well as we wish. With steam cultivation the case is altogether altered. The clover leys, if ploughed with horses, as is generally done even under steam cultivation, can be commenced early and finished early, while the cultivator is busy with the stubbles, smashing and cleaning them at a time when the sun has still considerable power, the days are long, and when, too, the power of vegetation is on the wane. It is difficult to estimate the great profit and advantage arising from such cleaning-work well done at this season of the year; but it is an advantage which will at once commend itself to the favourable notice of all practical men. And I would also suggest, as a great assistance to the still further carrying out of this important object, the propriety of getting the manure carted on to the young seeds before Christmas in the previous year, by which means the clover will be greatly benefited, the men left at liberty to take their places with the steam tackle, and the horses on the clover leys soon after harvest.

The reduction in the number of horses by the adoption of steam cultivation is a subject of great importance. We are so accustomed to see our clover fields and our oat and hay ricks pay their weekly tribute to the carter's stable, that we hardly appreciate the cost of our horses' keep; or, if we do think over the matter at all, we are fain to comfort ourselves with the sage reflection that "it all comes back again into the land," forgetting that the ton of oats or of beautiful clover hay is worth perhaps £6, while each ton of manure we get back is worth about 8s. I believe I am speaking within limits, when I assert that for each horse we can dispense with, we dispense with a positive expenditure of £45 per annum.

	£
Cost per annum for food, blacksmith's and saddler's bills, depreciation in value, repairs of implements worked by horse, and interest on capital per horse	33
Wages of men and boys working with and attending to horses, per horse per annum ...	12
Total cost per horse per annum	£45

Now, the number of horses on a farm containing 500 acres of arable land, of good but rather stiff loam, will be twenty, which we may value at £25 each; consequently the horses on such a farm represent a capital of £500, and cost annually for maintenance, attendance, wear of implements, and other expenses, no less a sum than £900. Yet, with these facts staring us in the face, we start at the bare idea of an expenditure of £500 in the purchase of a steam-horse, ever ready and willing to work long days without fatigue, costing nothing for food when not at work, and able to thrash and grind our corn, cut our chaff, and break our oilcake, in addition to performing the heavier portions of the tillage of our soil!

The amount to which the reduction in the number of horses can be carried will depend on the size of the farm and the character of the land; but the experience of those who have now for several years adopted steam on every variety of soil in the kingdom, many of whom are well known to the agricultural world, and whose names are a sufficient guarantee for the truth of their statements, may be taken as a fair guide on this point; and, basing my assertion on my own knowledge and these published statements, I am satisfied that I do not at all events exaggerate when I say that, *if the land is fairly clean*, we can, without inconvenience, dispense with from one-third to one-half of the number previously employed; and if this be so, have we not a good balance in hand to set against the first outlay, and against the anticipated loss to arise from hindrances and breakages? We must remember, too, that the alternative is not between the risks of steam machinery and perfect immunity from loss, but between the losses incidental to steam and those incidental to horse labour—such, for instance, as colic, inflammation, colds, accidents, and those other evils to which horse, like all other flesh, is heir.

It is difficult to arrive at a satisfactory conclusion with respect to the fair allowance to be made for wear and tear, which will vary so greatly with the nature of the soil and the management; as, however, it is necessary in the comparisons I am about to make to fix on some amount, I shall, in all cases, allow 20 per cent. on the cost of the apparatus for wear-and-tear and for depreciation in value, which will be found a sufficiently liberal allowance in any machinery of this description, and may be reduced by each farmer for himself, according to the circumstances of his particular farm.

PART II.—ON THE IMPORTANCE AND VALUE OF STEAM-CULTIVATION.

Having now stated generally the claims of steam-cultivation to our notice, I shall proceed, after a few preliminary calculations, to give an outline of the operations and their cost on a farm under steam-cultivation, side by side with an outline of the operations and their cost on the same farm under horse-cultivation. I am aware that the rotation of crops, and the succession of operations for any given crop, and also the cost of each operation, differ very much with the soil, the season, and the state of the soil; but as a number of comparisons would serve to confound rather than to enlighten, I intend to select a single farm under certain stated conditions, leaving it for the reader to alter, correct, and amend the outline according as his experience and the peculiarities of his farm may suggest. This outline, therefore, will be useless, or nearly so, to the mere theorist; but to the practical farmer, I believe it will be found of great value, by presenting distinctly to his eyes, in a real tangible form, the probable results of steam-cultivation on his own farm, whether for good or evil.

I shall suppose the selected farm to contain 500 acres of arable land, consisting of good and rather heavy loam. The fields to be some of them large, and others small; but all adapted for the operations of the steam-cultivator. Further, I shall suppose the land to be under good management, and consequently in good average state as regards both cleanliness and condition, and to be farmed in the following rotation: First year, turnips; second year, barley; third year, grass; fourth year, wheat; fifth year, oats. The apparatus employed for cultivating by steam, I shall suppose to be Howard's on the stationary principle; not as giving any preference to that particular system but because some one basis must be taken, and because I am most familiar with the working of that apparatus.

The estimate of the cost of the operations by horses is easy; but with respect to the cultivation by steam it is necessary to give a few figures, by which it will be seen that the amounts charged have not been put down at random, but may be relied upon with confidence.

Outlay for steam apparatus.

Howard's stationary apparatus complete, including 10-horse power double-cylinder engine, 1,600 yards steel wire-rope, and drag-harrows	£550
Deduct for six horses sold at £25	150
Total outlay	£400

Working expenses per day.

	£	s.	d.
Engine-driver	0	3	0
Windlass-man and ploughman at 2s. 6d.	0	5	0
Two anchor and two porter men at 2s. 3d. ...	0	9	0
One man carting water, &c.	0	2	3
Horse and cart for water	0	2	9
Three gallons of beer at 10d.	0	2	6
10 cwt. coals	0	10	0
Oil	0	1	0
Wear and tear and depreciation at 20 per cent. on £550	0	6	0
Interest on £400 at 5 per cent. × by 5, supposing that number of working days $= 73 = \frac{365}{5}$	0	5	6
Excess of wear in rope, say	0	3	0
Total	£2	10	0

N.B. Number of working hours per day $= 11\frac{1}{2}$, *i. e.*, from 6 a.m. to 7 p.m., stopping half an hour for breakfast and one hour for dinner.

These figures are open to examination and criticism, and from them it is easy to arrive at the cost per acre of any individual operation by steam, by dividing the amount, £2 10s., by the number of acres which will be accomplished per day. This will, of course, depend on the nature and depth of the work, and on the size of the field.

	s.	d.
Hence if the number of acres per day = 6, the cost per acre will be	8	4
If 8 acres	6	3
If 10 acres	5	0

We are now in a position to complete the proposed outline.

COST OF CULTIVATION WITH HORSES.

(Including all horse operations, except drilling.)

			s. d.	£ s. d.
For Turnips:	Oct.	Ploughing (1)…………	12 0	
	Nov. or Dec.	Ploughing (2)…………	11 0	
	March	Ploughing (3)…………	10 0	
		Scarifying ………………	2 0	
		Harrow, 4 tines ………	2 0	
		Roll……………………	0 6	
		Harrow, 2 tines ………	1 0	
		Ploughing (4)…………	8 0	
		Harrow, 2 tines………	1 0	
		Roll……………………	0 6	
		Harrow, 2 tines ………	1 0	
		Ploughing (5)…………	8 0	
		Harrow, 2 tines………	1 0	
				2 18 0
Barley:	Jan. or Feb.	Ploughing ………………	8 0	
		Harrow, 4 tines………	2 0	
	March	Ploughing………………	8 0	
		Harrow, 2 tines ………	1 0	
				0 19 0
Grass. Wheat:	October	Ploughing ………………	12 0	
		Roll (heavy)……………	1 0	
		Harrow, 2 tines ………	1 0	
				0 14 0
Oats:	October	Ploughing ………………	12 0	
	Nov. or Dec.	Ploughing ………………	12 0	
	March	Scarifying (deeply) ……	2 6	
		Harrow, 4 tines) ………	2 0	
				1 8 6
			5)	5 19 6
		Average cost per acre………		1 3 11

COST OF CULTIVATION BY STEAM.

(Including all steam and horse operations, except drilling.)

			s. d.	£ s. d.
For Turnips:	Sept.	Cultivating 8a. per day	6 3	
	,,	Do. across 8a. per day	6 3	
	March	Do. 10 acres per day ….	5 0	
		Harrow, 4 tines ………	2 0	
		Roll ……………………	0 6	
		Harrow, 2 tines………	1 0	
		Ploughing or ridging with horses………	8 0	
				1 9 0
Barley:	February	Cultivating 10a. per day	5 0	
		Steam-dray harrows……	2 0	
		Harrow, 2 tines ………	1 0	
				0 8 0
Grass. Wheat:	October	Ploughing *with horses*…	12 0	
		Roll (heavy)……………	1 0	
		Harrow, 2 tines ………	1 0	
				0 14 0
Oats:	Sept. or Oct.	Cultivating 8a. per day	6 3	
	Feb. or March	Do. 10 acres per day…..	5 0	
		Steam drag-harrows……	2 6	
		Harrow, 4 tines………	2 0	
				0 15 9
			5)	3 6 9
		Average cost per acre………		0 13 4

	£	s.	d.
Hence, average cost per acre with horses …	1	3	10 4-5
And average cost per acre with steam …….	0	13	4 1-5
Saving per acre by steam …….	0	10	6 3-5

If, then, we call the saving in the cost of the operations 10s. per acre, it follows that on this particular farm, and under the conditions named, the saving in the cost of the cultivations alone = 10s. × 500, or £250 per annum.

But, in addition to this, the more thorough cultivation of the soil to a greater depth will increase the produce. Nothing but a long course of years can enable us to determine the amount of this increase with any degree of certainty, and it is better to under-estimate than to over-estimate this advantage. I think, however, I shall not be accused of exaggeration, if I place this increase at two bushels per acre on the whole of the corn crops—

	£	s.	d.
2 bush. wheat on 100 acres=25 qrs. at 40s.	50	0	0
2 bushels barley and oats on 200 acres = 50 qrs. at 25s. ………………………………	62	10	0
Supposed increase in corn produce …	112	10	0

To this must be added a certain increase in the value of the roots and clover, which, however, I shall put at a mere nominal sum, adding to the previous increase the sum of £37 10s. (or 3s. 9d. per acre on the 200 acres), to prevent the fact of the benefit being lost sight of, and to bring the total to whole numbers—

	£	s.	d.
Saving in cost of cultivators……	250	0	0
Increase in corn produce ………	112	10	0
Increase in roots and clover ……	37	10	0
Total ………………	400	0	0

The above figures, it must be borne in mind, apply only to a farm in good condition and under good management; and, on such a farm of such a size, the steam-engine would not be allowed to lie idle when not required for cultivating. It would certainly be employed for thrashing, and probably for other minor operations—such as cutting chaff, crushing oats, breaking cake, and perhaps, also, for grinding corn for the cattle; and thus a still greater gain would be secured, which I have not taken into account, since the most expensive part of the apparatus—viz., the steam-engine—would be profitably employed a considerable portion of the year.

I must again repeat that this outline, though truthful and reliable under the given circumstances, must be corrected and adapted by each farmer before it is available in his own case. It is probable that, on consideration, he will be aware that certain portions of his farm, either by their position, by excessively irregular boundaries, by their hilly nature, or for other reasons which will naturally suggest themselves, are little adapted for steam cultivation; and in such cases he must make a partial, or entire deduction of such portions, in determining the number of acres of arable land to be steam-cultivated annually. Then, again, the succession of operations advisable on his farm may be so entirely different from that which I have laid down, as to require a complete revision of the outline; this, however, will be a matter of no difficulty to anyone who understands the management of his own farm, and the cost of the various operations. If, again, the soil of the farm is a stiff tenacious clay, well drained, and in good large, open, and level fields, it will be an easy matter to adapt the calculations to the altered circumstances of the case, and to arrive at a proportionately more favourable result.

In any case the great value of such an outline is this—that it clears away the mists of mingled generalities induced by the enumeration of a number of pros and cons, and enables the practical farmer to form a reliable, though only an approximate, idea of the advantage to be derived from the adoption of steam cultivation on his own farm, and with these remarks I must commend the comparative outline to the thoughtful consideration of practical men.

In an earlier portion of this paper I referred to certain difficulties which might interfere with the adoption of steam cultivation. Among these I enumerated want of capital; insecurity of tenure; small size, or hilly nature of farm; and the absence of a good supply of water. I propose now to make a few remarks on each of these.

Want of capital is fatal to all good farming, whether by horse or steam power; but, if after due consideration, a farmer with limited means decides on the propriety of adopting steam cultivation, the most judicious method is to divide the cost by a partnership in steam cultivation with a neighbour. Of course he will be subject to certain disadvantages, as the apparatus cannot be at work on two farms at the same time; but if the partnership be limited to two, these will be comparatively small. A thrashing machine may with advantage be added at very little expense if shared between three or four neighbouring farmers, as this is seldom wanted by more than one at the same time, and the occasional use of the engine for thrashing, when not required for cultivating, will prove an economy worth taking into account. As regards insecurity of tenure little advice can be given, each farmer being the best judge of the degree of importance to be attached to it in his own case. On this I will only remark that steam cultivating apparatus does not, like fixed machinery, involve great sacrifice in any removal. A portable steam engine is, as its name implies, easily portable, and is also at any time a marketable commodity. Next, as to the disadvantage arising from the small size of the farm. Many of the remarks already made with reference to want of capital apply here. Judicious partnership will afford almost the full benefit at comparatively little cost; but I do not think the number of partners so connected should exceed two, unless the farms are very small indeed, as, for example, each containing less than 150 or 200 acres of arable land. The hilly nature of certain lands must not be lost sight of; but, except in very steep and irregular hills, this is rather a matter to be considered in determining which system of steam cultivation to adopt, than in deciding whether or not to adopt it at all, consequently I shall reserve the more detailed examination of this for the next part of my subject.

The question of water supply is an important one, and should be carefully taken into account by both landlord and tenant. It is especially a landlord's duty, and, where a short supply exists, it may generally be remedied at little expense compared with its value. The quantity of water required for stock and for the supply of a steam engine is easily ascertained, as also is the average rainfall of the year; and a due consideration of this will, if no readier means is at hand, enable us to secure sufficient for our requirements. In the first place, the house and buildings, if not so already, must be spouted, and the water received into and stored up in tanks. Other tanks, again, may be sunk at a few convenient and well selected spots on the farm where the greater quantity of rain is likely to accumulate. Care must, however, be taken that there is sufficient tank accommodation to ensure a supply in the driest seasons.

Such, then, are some of the matters to be considered before embarking in the system of cultivation which I am advocating; and the conclusion to which we are led by the remarks I have made, and the arguments I have adduced is this—that steam cultivation is, on the great majority of farms, exceedingly desirable, both on account of its economy and its efficiency; and, further, that the practical difficulties attending its adoption are not only not insurmountable, but are such as can be easily met and overcome by any farmer possessing common sense and ordinary practical experience. This being established, I shall endeavour in the next portion of my subject to put forward as fairly, as lucidly, and as briefly as possible the special and comparative merits of the several systems of steam cultivation.

PART III.—ON THE DIFFERENT SYSTEMS OF STEAM CULTIVATION.

Many names have, during the last few years, been brought before our notice, as associated with particular systems of steam cultivation; and these systems have included many ideas of great beauty, ingenuity, and practical utility, which will doubtless become more recognized and valued as the farms of the country become altered and adapted in their general arrangements to steam cultivation; but as my purpose in these papers is to avoid as far as possible all theoretical treatment of the subject, and to write for the benefit of the practical farmers of the present time, I must dismiss several of these contrivances with but a few passing remarks, and dwell rather on the comparative merits of those plans which have been most fully tested.

The different varieties may, as far as I am aware, be all conveniently classed under one or other of the following divisions:—

1st. The Combined,
2nd. The Direct,
3rd. The Stationary, or Indirect.

Combined—Romaine; Boydell; Halkett: In this system the engine and implement are connected together and traverse the same ground.

Direct—Fowler (single and double engine); Coleman and Morton (Yarrow and Hilditch's patent); Savoy; Howard (double engine): In this system the engines, or the engine and anchor, travel along opposite headlands, the implement being drawn to and fro by a wire rope stretched across the field from one engine to the opposite, or from one engine to the anchor opposite.

Stationary or Indirect—Smith; Howard; Fowler; Fiskin: In this system the engine is placed at any convenient spot, and wire rope is laid round the field, and so arranged that a certain number of acres can be worked in any direction while the engine is stationary.

The first system, viz., the Combined, can hardly be said to be in use, nor do I conceive that, in the form proposed by Romaine and Boydell, it is ever likely to become general, as in each of these the ponderous engine and implement must travel over the land without any further preparation for their reception than can be devised in the shape of broad wheels and portable tramways. When we consider the enormous weight to be thus moved over land of various descriptions, some perhaps wet and sticky, some hilly, some deeply stirred by previous cultivation, and this not once only, but throughout the whole of every operation, I think we must condemn the plan as false in principle and a failure in practice. If the combined system is to make any progress, it must probably be somewhat on the plan proposed by Halkett, when the fields are previously prepared by the laying down of cheap and simple rails at certain intervals over every field on the whole farm; but the expense and general re-arrangement of a farm for this purpose preclude it from further consideration in these papers. Halkett's rails may be the handmaids of civilized and fashionable steam-cultivation, but we must look elsewhere for the hardy pioneers of unfashionable steam cultivation; we must look to other systems for the practical and successful cultivator of the present day.

We are thus left to consider the comparative merits of the direct and the stationary or indirect systems, which may be briefly summed up by the remark that the direct is, *where applicable,* the more economical; and that the stationary is of the greater general utility. There is, however, plenty of room for both; and although, in certain cases, it may be difficult to determine between them, yet, in most, a little consideration will enable the farmer to decide which is to be preferred for his particular farm. My object at the present time being a practical one, and my space limited, I shall not now dwell on the comparatively improved merits of the plans proposed by Savory, Coleman and Morton, and Fiskin, but proceed at once to compare the direct system represented by Fowler, with the stationary represented by Howard; for although each of these firms manufactures apparatus on both principles, I think I may fairly consider Howard as the champion of the one, and Fowler as the champion of the other. Smith is without doubt the original pioneer and champion of the stationary system: but his system is identical with that of Howard, and the differences between them in the details need not affect the remarks I am about to make.

In all apparatus constructed on the direct system, the engine will have to travel from end to end of the headland in every field cultivated; but in the stationary system the engine can be set down at any suitable spot, from which from 8 to 20, and in some instances 40 acres can be cultivated without any removal of the engine, provided the fields are large enough, and in other respects suited for the cultivation of so great a number of acres at one operation. Other pros and cons. will be entered into, but this marked difference between the two systems is the first point to be borne in mind, because a consideration of this, with a knowledge of the exact nature and position of his own farm, will go far towards enabling any farmer to come to a just conclusion on this important matter.

As regards the cost of individual operations, the advantage is decidedly on the side of the direct system, for these reasons: When the rope is laid *across* the field instead of *round* it, there is a much less length of rope out, fewer pulleys round which to pass it, fewer porters, and fewer men required to take charge of the several parts; consequently there is less wear for the rope, and less power absorbed in friction of the rope and other parts, to which we must add the saving of that amount of power lost in the stationary system by the brake employed to give sufficient tension to the slack-rope.

The amount of capital which must be sunk to embark in either of the systems will be estimated most fairly if I simply give the published prices taken from the most recent catalogues.

Direct System.

1st. Fowler's single 14-horse power engine with self-moving anchor:

Engine and apparatus complete, including 800 yards steel-rope and four-furrow plough	£875
Seven-tine cultivator or scarifier, extra	70
	£945

2nd. Fowler's single 10-horse power engine with self-moving anchor:

Engine and apparatus complete, including 800 yards steel-rope, and three-furrow plough	£759
Seven-tine cultivator or scarifier, extra	70
	£829

Stationary System.

1st. Howard's 12-horse power.

12-horse power double-cylinder engine	£310
Cultivating apparatus complete, including 1,600 yards steel-rope	250
	£560
Four-furrow plough, extra	80
	£640

2nd. Howard's 10-horse power.

10-horse power double-cylinder engine	£270
Cultivating apparatus complete, including 1,600 yards steel-rope	250
	£520
Three-furrow plough, extra	65
	£585

If the direct system with double 14-horse power engines be preferred, the cost of the whole will be about £1,400.

These totals need little comment; but although farmers, generally speaking, are not so flush of money as to make the difference of a few hundreds a matter of indifference, it is a false economy to purchase the cheapest apparatus if, in all other respects, the more costly is preferable.

The cost of labour per day under the two systems will be as follows:

Direct System.—Fowler's single-engine, with self-moving anchor:

	Per day. s.	d.
Engine-driver	3	0
Anchor-man	2	3
Ploughman	2	6
Two porter boys at 1s. 6d.	3	0
One man and horse carting water, &c.	5	0
Beer 18 pints	1	10½
Total per day	17	7½

Stationary System.—Howard's.

		Per day. s.	d.
Engine driver	0	3	0
Windlass-man	0	2	6
Ploughman	0	2	6
Two anchor men at 2s. 3d.	0	4	6
Two porter boys at 1s. 6d.	0	3	0
One man and horse carting water, &c.	0	5	0
Beer, three gallon	0	2	6
Total	£1	3	0

The cost per day for coals and oil, wear-and-tear, and interest on capital will, of course, vary with the power and size of the engine and apparatus; but the cost for labour will, in each case, remain the same whether the work is performed by an engine of eight-horse power or of fourteen-horse power, a consideration of great importance to steam cultivating companies, and not to be lost sight of by farmers purchasing tackle for their own use; hence the advantage of using an engine of large power; but on this point the tenant farmer will hardly need to be reminded that the increase in power involves an increase in the first outlay, and also an increased weight to be dragged from field to field; while for all common operations, such as thrashing, &c., an eight or ten-horse power engine is quite as well adapted.

An important advantage on the side of the stationary system is in the expense and trouble attending the supply of water to the engine. This, in the direct system, must be conveyed to the engine wherever it may happen to be during the progress of the work, however bad may be the travelling along the headlands, or other road of access, and however remote such point may be from the source of supply. In the stationary system, on the other hand, the position of the engine is frequently so unimportant, that the best mode of supplying it with water may often guide us in placing it. This will, in many cases, reduce the cost from that of a man and a horse and water cart, to that of a man only, who can supply it with pails, and sometimes the engine can feed itself by means of a pipe laid into an adjacent pond, well, or tank.

I shall next consider the question of adaptation to fields of various shapes, sizes, and undulations. Here, again, the advantage is strongly on the side of the stationary principle. In the direct system, the engine itself takes up a considerable width of headland, and as the implement can only approach within a certain distance of the engine, the total width to be left becomes, in very small fields, a matter of importance. Then, again, it is requisite that the headlands be kept in a fit state for the engine to travel along them, for which reason some farmers prefer to leave them always in grass; this, however, is in itself unsatisfactory, and when it is wished to cultivate the fields across, the engine must leave such headland and travel at right angles to its ordinary path. If the fields vary greatly in width from the irregular nature of their boundaries, spare lengths of rope must, in the direct system, be occasionally inserted, or taken out, although, in the case of minor variations, the necessity is obviated by an ingenious contrivance for winding up spare rope on the implements and giving it out when required. In hilly districts another difficulty arises in the direct system, for then the engine must frequently travel up steep hills, for which work it is but little adapted, either by its weight or its construction, or else it must leave considerable portions of the farm to its humbler, but less fastidious helpers, the horses. Not so with the stationary system; there are few fields so steep, so irregular in shape, or so small in size, but that the exercise of a little judgment in placing the engine will enable us to work economically, as the anchors and pulleys occupy but a small headland, and can easily be placed wherever required to accommodate themselves to variations in the shape of boundaries, and any hills, within moderate limits, can be worked across, or even up and down, without material loss of power, as there is only the implement to be drawn up.

I have dwelt somewhat fully on this portion of my subject, because it must always be remembered that easy adaptation to circumstances is, in steam cultivation, equivalent to a great reduction in the cost per acre, as, in the first place, a much larger portion of an ill-arranged or hilly farm can be economically placed under steam cultivation; and, in the next place, less time is lost in alterations and adaptations. One consequence, however, of this very advantage in the stationary system is a disadvantage in the time lost in shifting the tackle from one field to another. Here the direct system stands far ahead of its rival the stationary, as, in the former, the parts to be moved are few, though large and heavy, and the engine, being of necessity a traction-engine, is always ready to draw together and carry off its train with but little delay; while, in the stationary system, the pulleys, anchors, &c., are more scattered over the field, and must, for the most part, be collected by men and horses. The engine, too, is seldom a traction one, though there is no other objection to its being so but the increase in cost and complication.

Having thus endeavoured to place clearly before the reader some of the characteristic features of the two systems, with their respective advantages and disadvantages, I must remark that the due amount of importance to attach to each of these will depend much on the individual circumstances of each farm and farmer; but a careful consideration of the points I have referred to, and of the nature and peculiarities of the farm which it is proposed to cultivate, will, I believe, enable the reader to arrive, without difficulty, at a satisfactory conclusion. I shall, however, conclude this portion of my subject by briefly stating my own conclusions, based upon the above considerations. If the farm is of large size, and tolerably level—if its fields also are of large size, with regular boundaries—I should give the preference to the direct system, because, in this case, the disadvantages of that system are brought within narrower limits, whilst its economical advantages are allowed fuller play. But if the farm is of moderate size, if the fields are of irregular shape, and some of them small in size, then I should prefer adopting the stationary system, which, while it is within the compass of an ordinary farmer to obtain, is also simple and easy to manage with the aid of ordinary labourers, and capable of adaptation to almost any field. I purposely abstain from naming any positive number of acres as being that to which either system is best adapted, because this will vary with the other circumstances of the case, and the terms I have used will be allowed the requisite latitude by all practical men.

PART IV.—PRACTICAL SUGGESTIONS AND HINTS FOR INTENDING STEAM CULTIVATORS.

Great as are the advantages to be derived from the adoption of steam cultivation, the greater part, and indeed the whole of these advantages, may be nullified by carelessness or want of management; and if the machinery when purchased be thrown into the hands of ignorant and incompetent men, without constant supervision and watchfulness on the part of the owner or his bailiff, disappointment and failure must and will ensue. Men are mixed up with the cultivating machinery, and form part and parcel of it when in operation, and these men are, for the most part, uneducated and untrained; until therefore they have become accustomed to their new work, there must be no relaxation of the master's watchfulness. I propose in the present paper to put forward such general and particular hints, suggested by my own experience, as may save future steam cultivators many of those avoidable losses and disappointments which earlier ones have sustained.

Whichever system of cultivation is adopted, one great object should always be to take every precaution that the largest proportion possible of the power given out by the engine, or rather, I should say, by the fuel in the engine, is transmitted to the implement. It is surprising how much of this may be wastefully absorbed, if due attention be not paid to the state of every part of the apparatus. Foul tubes will cause a large portion of the heat to pass uselessly up the chimney. Neglect of oiling, or bad porterage, will absorb much in needless friction.

Another great object should be to avoid all needless hindrances. When the machinery is set down, and the work commenced, the expenses of cultivating are going on, and every effort must be made to cut down all stoppages to the very lowest point. A stoppage of a minute, or even of a few extra seconds, at the end of each journey of the implement may seem trifling; but it forms a large percentage of the whole time, and soon makes the difference of an acre or two in the course of a day, for the whole time taken up in crossing the field frequently occupies not more than two minutes. The adjustments and reversals should all be so arranged, that as soon as ever the implement has come to a dead standstill all is ready for the return journey. The great importance of this saving of time in the economy of steam cultivation induced me to devise my "patent snatch-block sling," by which the hindrance in shifting the pulleys in the stationary system is entirely obviated.

These general objects being kept in view, I would next say, "Make yourself master of the machinery in all its details, so that you can see where a fault exists, and know how to remedy it." This may seem somewhat difficult; but the machinery is really very simple, and its arrangements easy to understand; and, if the precaution be taken to secure the services of a man from the maker for a day or two at starting, or to procure the advice and assistance of any practical friend who has already adopted steam cultivation, sufficient knowledge will be obtained for the necessary superintendence, and experience will rapidly increase this as the work proceeds.

Next, I would say, "Act kindly and liberally towards your men." There is in steam cultivation no hard work whatever, but attention and quickness are required, and the hours may be long. It will soon be seen which men are best adapted for particular posts; but in spite of every precaution, it is probable that a few minor accidents will occur at first from want of knowledge, or even from inadvertency and carelessness. When this happens, blame kindly, and make the cause of the accident clearly understood; but never allow it to be passed by, as if the inanimate thing "would go wrong." After a few days' practice, the men will get accustomed to the work, and accidents, in most cases, be very few and trivial.

Perhaps it may seem almost impertinent to say to practical farmers, "Never scamp the work;" but when the right time comes, there is always a temptation to do the work inefficiently, in order to get over a large number of acres per day. This, however, must never be yielded to; the work must be vigorously, but thoroughly, done, and the increase in acreage must be sought for in the avoidance of all unnecessary hindrances.

"Always have a good stock of duplicates of every part liable to breakage." To save a few pounds laid out in these is, I would most emphatically say, penny wise and pound foolish. These parts vary so greatly with the system, that it would be useless to attempt to enumerate them; but either the manufacturer or any practical cultivator will gladly give this information to the purchaser, unless he prefers learning it at far greater cost from his own practice.

Again, "Never spend much time in attempting to cultivate odd gores and corners." Just as in horse cultivation the corners and odd pieces are best left to be dug over by hand, so will it be found more economical to leave awkward bends and narrow slips to the horses, than to fritter away time with the steam cultivator.

Your engine-driver need not be acquainted theoretically with his engine, nor need he even understand the construction and arrangement of many of those parts which he cannot see. An intelligent and *steady* farm labourer may soon be trained into a good and trustworthy engine-driver. Of course he must attend well to the state of the keys and nuts, and to the regularity in the working of the engine, but the grand thing to impress upon his mind is this: "*Never let your steam get too high, or your water too low.*" The limits which he must not exceed or fall short of in these are easily understood, and any neglect here is unpardonable, and may be attended by fatal consequences. If the engine is out of repair, either from a leakage of the tubes, a flaw in the fire-box, or from any other cause, never suffer it to be tampered with by any one whom you do not know and can trust. Have it looked to at once by some one in whom you can place confidence, and remember that "a stitch in time saves nine."

The wear of the rope must be noticed next, as it is *the* great item in wear-and-tear in steam cultivation. To reduce this as much as possible, great attention must be paid to the portering, and to the tension of the slack rope. Steel rope of the best quality should be purchased, and the utmost care taken to porter it well when travelling over hills or brows, at which time the pressure, and consequently the wear from friction, must be very great. A little forethought will frequently enable us to avoid this fruitful source of destructive rope wear. For instance, in the direct system the engine may often be made to travel along a ridge instead of a hollow; and in the stationary system it is still more easy to arrange the position of the engine so as to prevent the implement having to travel across a brow or hill. This rule should be carefully observed whenever practicable; but above all, never allow the rope to "grind" when passing over brows. A sharp brow on a gravelly soil is the greatest enemy to the wire rope. I do not recommend the employment of too many porters in the line along which the implement travels: a few high porters well placed and well looked after will do more good than a greater number neglected, and frequently overturned. Few things depend more on management and on the nature of the soil than does the wear of the rope. While on this subject, I may remark that the best plan to avoid the vexatious hindrances arising from the breaking of the rope, is to observe the first symptoms of weakness, and to repair or cut out the faulty part before, or after, the regular work of the day, instead of waiting until a rupture occurs. A couple of men will in this way make a better job of the repair, at a far less expense and loss of time, than by hurriedly splicing while the whole gang are delayed and looking on.

Leaving these matters of detail, it is important to bear in mind that every effort must be made to get the work well forward, and to keep it there. If, therefore, the season is uncertain, and the steam-cultivator delayed, it will be better to go on steadily with such portions as are least adapted to steam, with the horses, rather than to rely too much on the ability to make up for lost time; lest, if the horses be allowed to lie idle, and the steam-work be deferred to long, the old fable of the hare and the tortoise may be again illustrated. I have before hinted at the propriety of expediting the autumn-work by carting the manure on to the young seeds before Christmas the preceding year, and this principle may often be advantageously extended to the fallows, *if the land is clean*, by getting the manure spread on the stubbles before smashing them up.

It will probably have been observed that hitherto I have said nothing of the respective merits of the plough and the cultivator. My reasons for this are, first, because I do not think that this matter has, as yet, been sufficiently tested under steam-power; and, secondly, because each farmer will not be able to estimate their merits to a great extent by his knowledge of the character of his own farm. Still, a practical paper on steam-cultivation can hardly be considered complete without some reference to the subject. Greater power is required to plough land than to cultivate it, but in what proportion has not yet been clearly ascertained. When the object is to clean light land containing much couch or many docks, the cultivator is greatly to be preferred to the plough; it tears the couch and docks to the surface, and places them just where they are wanted for future operations, without cutting to pieces or burying them. When, however, such land is free from couch, but covered with annual weeds, I think the plough is occasionally preferable, especially if the season be showery, in which case the annuals speedily take root again, and interfere materially with the preparation of the land for drilling. In a favourable season nothing can be more perfect than the operation of "smashing" on heavy land; but, if the weather will not allow the soil to become sufficiently dry for this, the cultivator is apt to "cut" its way through to a certain extent, instead of "smashing" the soil, as desired; under these circumstances a thorough inversion with the plough would probably be a more satisfactory operation. These remarks I put forward as suggestions for reflections, and it will be seen that, while looking upon the cultivator as *the* steam apparatus, I regard a plough as a desirable addition to the apparatus for occasional use.

I propose, in concluding these papers, to make a few more observations on the subject of letting the tackle out on hire. I have before stated that I prefer partnerships as a means of economizing the outlay; but as a satisfactory partnership cannot in many instances be arranged, it will be well to give a little consideration to the other alternative of executing work on hire. I cannot, however, recommend the farmer to place much dependence on this *as a business*, for, if entered into largely, it cannot fail of interfering greatly with his own farming operations, which must suffer by being made subordinate, and, if so, any advantage gained by letting out will be more than counterbalanced by the loss entailed at home. Again, it is most probable that the fields offered to him will be the foulest and stiffest—the ugliest work in the district in fact—and such work can seldom be done satisfactorily on hire, for, after making due allowance for the extra wear-and-tear, travelling expenses, superintendence, and extra cost of labour, even ordinary work must, to leave a fair profit, be charged about double the amount it will cost at home, and such extraordinary work as I refer to can only be executed on such terms as will alarm the hirer. In saying this, however, I must not be understood to condemn the practice of occasionally letting out to neighbouring farmers, at a fair price, and at a time when neither the apparatus nor the staff of men are wanted at home. This may be a mutual accommodation and advantage, but it will be too trivial and uncertain to be relied upon as likely to afford any great return or profit.

POTATO FARMING.

The potato crop is year by year becoming more important, not only to the farming body, but to the whole community. The price of potatoes has ruled very high throughout the winter, and there is every probability of good varieties commanding a still higher price. This is not entirely owing to a deficient crop, although that has been seriously injured by the disease, but it is for the most part owing to the wonderful demand for them by consumers. In every household potatoes enter largely into the consumption, and in very many poor families constitute the chief food at this time, in consequence of the high price of bread and "butcher's meat." Besides, the quality of potatoes has of late years so surprisingly improved, that they do really constitute a good, wholesome, and nutritious food. This is in a great measure effected by the superior culture adopted, and the management to which they are subjected from beginning to end. Potatoes of bad or inferior quality are almost unsaleable in any consuming market; hence the greatest perfection of growth which can be attained, and the superiority of dressing for market to ensure quality, have become imperatively necessary. I will therefore make a few observations relative to the preparation of the land for the potato crop, the manurings, and the best mode of putting in the sets.

The land most suitable for the growth of potatoes is a rather light, rich, free loam, of considerable depth. All lands intended for the potato crop should be managed so as to assimilate them as near as possible to these loamy soils. This will require very careful management and excellent judgment. All these stiffer and strong loamy soils should be trenched up in the early winter—*i. e.*, they should be broken up immediately after harvest (the most valuable employment for steam-cultivating implements); and in suitable weather, after wheat-seeding, they may be ploughed into tenches or ridges. In this state the soil receives all the ameliorating influences of the atmosphere, frosts, &c. and in the early spring they must be broken down by large harrows or scarifiers, so as to leave the soil open or rough till near the time of planting. As this time approaches, it should receive all the requisite harrowings and pulverization necessary. If this is carefully and patiently done, it will not require any additional ploughings. The great aim must be to keep all the soil open and friable till the precise time of planting, when all should proceed with the greatest expedition in manner as stated below.

The lighter, or the rich free loams, are, in good seasons, quickly prepared for the planting. It is customary to plough them up at considerable depth—*i. e.*, from eight to ten inches—in dry weather during the winter, and then await a suitable season in the spring, when they are broken up by drags and scarifiers or large harrows, and are thus kept in a state of pulverization up to the time of planting. Many excellent crops are obtained in this summary way when more extended cultivation has proved to be a partial failure. There can be no objection to the treatment of these soils after the manner of heavy loams, as above stated, but it is not so requisite. I am of opinion that it is much the safest way, taking our fickle climate into account. All ploughed lands in wet weather will run more or less together, and frequently so close as to defy harrows to break them up; consequently, reploughing must take place, which is a serious hindrance. The value of this additional ploughing is, however, by no means thrown away, as it often happens to be the very thing desirable to promote speedy and effectual working of the soil. The great aim in every instance of preparation of the soil for potato-planting must be to obtain a deep, well-pulverized mould—not dust, but a free running mould. No trouble or difficulty should stand in the way of accomplishing this decided ultimatum for a crop.

Manure.—This is of immense importance to the potato-grower. Depend upon it, the old adage is correct in this case, "Where there's muck, there's money." Mangolds, swedes, and turnips, will all yield good crops under artificial manure, and so will potatoes on fresh soils; but manure is more beneficial and necessary to potatoes than to most farm crops. I venture to recommend every potato-grower to any extent to make his foldyard manure as rich, and as much of it, as possible. I would even urge him to consume the bulk of his root crops in the foldyard. Potato-growers may find sheep-keeping at a cheaper rate than growing turnips for them on a potato farm. Neither can the turnip-fed lands be readily prepared for potato-planting, if so desired, owing to the treading. The foldyard manure, then, is to be the staple commodity for the potato crop: to be used fresh from the yard is best; but it may be surprisingly aided by artificial manurings, *i.e.*, Peruvian and other guanos, superphosphate, blood manure, and many of the special potato manures. One of the best artificial dressings known is two-thirds Peruvian guano, one-third superphosphate—4½ cwts. per acre. I have tried on loams of medium character various artificial manures, with good result—*i.e.*, superphosphate, blood manure, potato manure, Peruvian guano, &c.—both in conjunction with foldyard manure, and without, and in equal proportions. Other manures, as above, will cause equal, if not earlier, progression of the planting, but guano tests its superiority at the close. No artificial aid is fully equal to it for carrying out the potato crop to its greatest perfection.

The Best Mode of Planting, or Putting in the Sets.—This is a most important part of potato-culture. The soil, we will suppose, is got into a high state of pulverization; if not, woe to the prospect. The most preferable course, then, is to plant the sets upon the ridge system, *i.e.*, first, to set out about nine to eleven rows or ridges with the plough, at a moderate depth; then have carts loaded in readiness, and, as quickly as possible, manure three ridges, spreading it carefully between them; then sow, from a hopper or basket, the artificial manure to be used, at the rate of 4½ cwts. per acre, down the hollow between the first two ridges, and immediately plant the sets along it by a number of plantmen, to keep all going. As soon as the ridge is planted, the plough is ready to commence covering them by turning the ridge upon them, and so closing one ridge up and opening another; and so the whole process goes on throughout the field. Each planter must have an allotted length to plant; and the aim must be to finish this length of setting before the return of the plough. In this way, all goes on simultaneously—the ploughmen, the manure-carters, the manure-sowers, the planters. My own practice is to have a double set, so as to keep two ploughs continuously at work. A little common care and foresight is requisite to arrange all nicely, so as to prevent loss of time or hindrance. The width of the ridges should not be less than thirty inches, nor wider than thirty-four inches. The distance from set to set should vary according to the variety of potato: Flukes, from ten to twelve inches apart; Regents, from twelve to fourteen inches; Rocks, from fourteen to sixteen inches; all others in similar proportion. The less growth of haulm the less space apart, and *vice versâ*. In dry weather, the ridges should be lightly rolled down, not otherwise. The chief design should be to obtain the greatest weight of marketable tubers, not the greatest quantity: hence, wide planting is best. The sets, too, should be of good size, and not abounding with eyes. Every good eye produces a stem; too many stems produce too many tubers, which, on that account, must inevitably be small: hence, plenty of "seed," but not much "ware." The time of planting should be somewhere between the first of March and the middle of May. The latter end of March is probably the best time. As soon as the plants appear above ground, the horse and hand-hoeing should commence: it promotes growth, and keeps them clean. The moulding-up should be done when in full growth, so as to prevent covering up; and the moulding should be tolerably close to the top, so as to form a ridge without a trough in it. Occasionally, it may be right to mould-up more than once, depending upon circumstances. One word as to soils for potatoes. It is an expensive crop to get. I think it should not be grown on any inferior soil. Stubborn clays are almost impracticable. Light sands or gravels will not return yield enough. Fen peat, alluvial loams, mild clays, or clayey loams, will do well.

FELDSPAR PREPARED FOR MANURE.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

The new manure which I present is entirely mineral, and is a direct application to agriculture of feldspar and feldspathic rock, which may be considered as an inexhaustible mine of potash by reason of the importance of the deposits of pigmatite —those of syenite, which are essentially rocks of feldspathic potassium, and on account of the position held by feldspar in the composition of granitic rocks, and of eruptive rocks, properly so called. It is also from the decomposition and deterioration of these different rocks that the potash is derived, with which the generality of soils of the sedimentary formation are impregnated.

According to the extent of the crystalline deposits, and the proportion in which the feldspar is found in relation to the quartz in the pigmatites and to the quartz in mica, granites, and gneiss, we may admit that the mineral potash enters for about one-fifth into the composition of the solid parts of the earth. Its position in alkali is very remarkable: since, according to the analyses of Messrs. Berthur, Gustave Rose, Bendant Malaguti, &c., feldspar contains variable quantities of potash, say from 12 to 16 per cent., which gives from 19·2 to 25·6 of carbonate of potash-*anhydrite*.

The agricultural importance of potash is well understood; it has been pointed out by chemists and the most eminent cultivators, and its ancient name of *vegetable alkali* bears witness to the attention that has always been paid to it. It is classed with the most energetic vegetable agents, and we have often sought for the means of procuring this alkali in quantities suitable to arable lands, whether to repair the extractions made each year by the crops, or to enrich those soils that are insufficiently provided with it. The rubbish collected upon the waste land, the marl, the lime, the waters of irrigation, the rain, and even the dust brought from far by the winds, undoubtedly supply appreciable quantities of potash; but it is, in general, rarely that these compensations are found sufficient. Vegetable ashes, which owe to potash the great portion of their vegetative properties, are, as a whole, an extremely limited resource, and in almost all cases they come back to agriculture only in the state of lixivied ashes—that is to say, deprived of what constituted their principal value. Independent of the potash expended by domestic use, the requirements of the manufactory absorb considerable quantities, and up to the present time almost the whole of it is furnished by the incineration of vegetables.

In his researches into vegetable chemistry M. Payen has discovered that azote appears to be superior in importance to oxygen, hydrogen, and carbon, having ascertained that azote is in greater abundance in the vegetable tissues when young, and possessing a greater vegetable energy at the extremities of the young shoots, buds, and radicles.

The same pre-eminence may be attributed to potash over other mineral matters that enter into the composition of vegetable tissues, the analysis of ashes indicating always increasing quantities of potash, in passing from what is called the perfect wood to the alburnum, the branches, the twigs, the arms, the young shoots, and from these to the leaves. This alkali appears, therefore, to co-operate powerfully with the vegetative impulsion. However, if it is admitted that vegetables obtain their azote from two sources, namely, the soil and the manure on the one part, and the atmosphere on the other, it is equally certain that the mineral matters can be furnished only by the soil; what the rain and the dust supply may be put out of the question.

Although we are still ignorant of what is the true nature of the substances that constitute mineral matters that are found in the sap of vegetables and in their tissues, it is not the less clearly ascertained that their action is most essential, whether in relation to the health of the vegetable, or that of the economic value of the product we derive from its culture.

In this notice I ought to limit myself to mentioning the action of potash; and we are aware that some plants are more specially designated under the name of *potash plants*, on account of the strong dose contained in the ashes. The quality of the produce appears to depend much upon the greater or less richness of the soil in alkali. The potato, the sugar-beet, the turnip, the Jerusalem artichoke, are specially potash plants, and to this list we ought to add the vine and the tobacco. In the first class, the vine, the vegetation of which is always so much the more active and healthy, and the quality of the produce so much better,* from the application of a sufficient proportion of potash to its roots. Those soils sufficiently furnished with potash add bunches to the vine, and the produce is enormous when the culture admits only of small doses of organic manures, but requires, above all, an abundance of mineral manures. Tobacco, the cultivation of which has become already of so much importance in France, and which ought to be still further extended, requires a soil rich in the potassic element, although it is classed amongst the lime-plants. From the analytical researches of M. Schloesing, director of the tobacco manufacture of Paris, we are taught that the leaves ought to contain a certain proportion of potash, in order to furnish tobacco of good quality, and that the inferiority of the tobacco from certain countries of France is owing to the poverty of the soil in alkalies, which is as much as to say that they are produced in a soil insufficiently supplied with potash.

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* In the Rhenish Provinces and in Herault, they obtain good results from the vine and lucerne fields by the employment of decomposed basalt.

In consulting the analyses of M. Isidore Pierre, in his "Agricultural Chemistry," we see that the strong diffusion of potash in the ashes furnished by different crops bears further testimony to the importance of that alkali. The ashes of wheat contain of it from 24 to 29, and even 33 per cent. under certain circumstances. The ashes of leguminous plants hold variable quantities of alkali, ranging from 22 to 45 per cent.; and in those of colza and linseed the proportions are from 22 to 25 per cent.

According to M. Boussingault, the quantities of potash taken from the earth per hectare, by an average crop, are

For potatoes	63½	kilogrammes.
„ beetroots	90	„
„ turnips	40	„
„ Jerusalem artichokes	140	„
„ wheat	26	„

The subtraction of potash by each crop of wheat may be increased to 38 or 45 kilogrammes per hectare, increasing as the crop reaches 16 or 20 hectolitres. The ashes of the vine-shoots, analyzed by M. Boussingault, contained a little above 20 per cent. of potash, which represents 32 per cent. in carbonate of potash, a quantity to which we must add the appreciable dose of alkali taken to the soil by the residuum of the grapes and by the vine itself. In most cases, and by an average crop, the previous abstraction of potash per hectare of vine ought not to be less than 60 kilogrammes.

If for domestic leguminous plants lime appears to be a pre-eminent element, their ashes containing 26 per cent. for white trefoil, 37 ditto for red clover, and 50 ditto for lucerne, the action of potash is not modified in it, since it is represented by 14 per cent. for lucerne, 27 ditto for red clover, and 34 ditto for white trefoil.

Living in a country having a granitic soil, and for a long time engaged in working materials for porcelain, I have always been in the midst of the mass of alkali, which is one of those constituent elements, and without stopping to entertain the idea of an extraction of the potash in a commercial form, which has been effected at different intervals by skilful chemists, a problem not solved (at least, in an industrial point of view), so surrounded is the subject with difficulties, I have employed myself in searching for the means of arriving at a specially agricultural application of it, which is inevitably more important than the elaboration of the potash as a product applying only to manufacturing purposes. This alkali is a vegetative agent, in every respect most essential to agriculture, whilst it is only required by a few manufacturers. The agricultural products of France exceed in value seven thousand million francs (or £280,000,000 sterling), whilst those of its mineral manufactures are about one-tenth of that sum.

In order to render easy and practical this application of the feldspathic rocks to agriculture, it requires that the potash should not be isolated in combination with the stony matter which constitutes the feldspar, and would but ill satisfy the good requirements of vegetation, but merely to render it assimilable. In consequence of investigations into the vegetative properties of old country mortars made with sand and feldspathic ore, I have found out what eminent producers of soluble salts of potash these feldspathic mortars are, and how much they surpass in vegetative action the old mortars made with siliceous sand, which yield only azotate of lime, and contain only a very small quantity of potash, furnished by the lime where it is argillaceous.

After experiments, followed up during many years, I have arrived at an elementary treatment, which consists chiefly in a kind of cementation of the feldspar by the lime, which being stopped at the point at which would commence a loss of potash, but which sufficiently changes the relation of the basis of the double silicate, in order that under the influence of the action of the atmospheric agents, of the carbonic acid with which the air and water that impregnate the soil are more or less saturated, and of the organic matters, there was a disunion of the elements of the silicate of potash, and a formation of nitrate and carbonate of potash, which in presenting themselves are in the nascent state, and in some respects, in proportion with the wants of the plants, are found in vegetative conditions the most favourable.

The *feldspar prepared for manure* being in dust of a proper tenuity, that definitive and productive decomposition of vegetive salts is continued progressively up to the complete destruction of the stony silicate; each grain of feldspar kaolinises itself by degrees, thereby giving birth to clay, to soluble salts of potash, and to soluble silica. The phenomena of transformation being effected only successively, and by layer in some way, and without appreciable thickness, it follows that this is essentially *admirable manure*, which in the meantime is felt by its action the first year, which has been demonstrated by multiplied experiments upon the vine and hoed plants. The duration of seven or eight years which I have assigned *à priori* to this manure, according to the examination of feldspar experimented upon, is confirmed up to this time by practice, and the quantity to employ for a period of that duration is from 3,500 to 4,000 kilogrammes, according to the average amount of potash annually abstracted from the soil, and basing itself upon the mean minimum amount of the feldspar employed, 11 to 12 per cent. of potash, which is equivalent to 17½ or 19 per cent. of carbonate.

The multiplied experiments I have instituted have perfectly demonstrated to me that *feldspar manure* may be applied to all crops, as well arboraceous as herbaceous; but I have been more particularly engaged with its application to the vine, for which it is a special manure, always easy to apply properly. In all cases in which *prepared feldspar* has been applied to it, there has been a noticeable increase in the activity of the vegetation of the first year; and it has appeared that those parts of the vine that had received the feldspathic manure had suffered less from the *coulure* (falling off of the fruit) than the rows left out.

Fruit-trees, peaches, apricots, and prunes having received feldspathic manure, have shown an increase of vegetation to a remarkable extent; and, as with the vine, we are enabled to state an improvement in the quality of the produce. I may, above all, mention the good effects upon apple-trees, whether recently planted or when they had acquired their greatest growth. In other respects, all fruit-trees, in order to yield produce of a healthy and good quality, must receive farm manure only in very small doses. The potassic element appears sufficient to complete the quality of the fruit as well as to stimulate vegetation. Applied to the alimentary legumes (haricots, lentils, beans, &c.), the feldspathic manure has increased in a remarkable manner the quantity of *siliquas*, or fruit, without exhibiting any excessive increase of vegetation.

I shall again cite essays on the potato and the turnip. For these two plants, the action of feldspar bears especially on the number and size of the tubers in the potato, and upon the bulbs in the turnip, at the same time giving to the exterior parts a more vigorous vegetation and a dark-green tint. The roots (or bulbs) of turnips had a more solid and less watery pulp than those growing on land that had received only farmyard manure.

Fetdspar, prepared for manure, may be employed alone, mixed intimately with vegetable earth; but it is in all respects preferable to put it in compost with dung or any other organic manure, carefully prepared under a well-aired shed. It is, above all, for annual or herbaceous husbandry that its employment in compost made with ordinary dung appears suitable. For the compost intended for the vine or fruit-trees a proportion of vegetable mould or the scrapings of ditches appears to me proper, to replace the farmyard manure; and in both cases, by the employment of compost we complete the operations favourable to the formation of the soluble salts, and nitrification.

It is not in competition with organic, azotized manures of the farm or of commerce that this mineral manure presents itself, as is the case with the feldspathic rocks. It is too well admitted and acknowledged that the farm manures are fundamental, and cannot be superseded. The prepared feldspar is brought forward, on the contrary, only to complete and supplement the habitual insufficiency of these, in salts of potash.

The name of the new product which forms the subject of this notice, its nature, origin, and the real importance of the deposits which furnish the matters of it, measures the degree of attention which ought to be accorded to the *feldspar with a potassic base, prepared for manure*. The first matter can never fail; and the new economic conditions afforded by railways ought to help in facilitating its employment.

The well-accepted ideas on the composition of the feldspathic rocks, the origin of potash, and the acknowledged importance of this vegetative agent, on the one hand, the in-all-respects positive results of my experiments, long continued and multiplied, on the other, have not appeared to me motives sufficient to justify me in immediately recommending its employment to agriculturists—that is to say, to seek for customers for its purchase. I have, in the first place, put myself in communication with a sufficient number of practical farmers, of the districts of Bordeaux, Agenis, Armagnac, Toulouse, Lower Languedoc, the environs of Bayonne, and even the Pas-de-Calais (for the sugar-beet), who have most wiltingly granted me their assistance by accepting, gratuitously and free of carriage, sufficient samples, of not less than fifty kilogrammes (one cwt.), and which in many cases have been one hundred to two hundred and even four hundred kilogrammes. I may add that the good results of these experiments, which have especially showed themselves on the vine, have led to the commencement of a regular sale.

JULES GINDRE, Civil Engineer of Mines.

Itxasson, near Bayonne.

THE HYPOTHEC AMENDMENT BILL.

The following is a copy of the Bill prepared by the Lord-Advocate "to amend the law relating to the landlord's right of hypothec in Scotland, in so far as respects land held for grazing or agriculrural purposes," and which has been read a first time in the House of Lords:—

Whereas it is expedient to amend the law relating to the landlord's right of hypothec in Scotland, in so far as respects land held for grazing or agricultural purposes, be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled, and by the authority of the same, as follows:—

I. This Act shall apply only to Scotland, and may be cited for all purposes by the title of the "Hypothec Amendment (Scotland) Act, 1867."

II. This Act shall be construed as applying only to farms or occupations of land, with the buildings thereon, held or used for farming purposes, and shall not apply to subjects within burgh, or to dwelling-houses, shops, and other subjects, though the same may be in rural districts, where the primary or chief purpose of the occupation shall be other than the raising of corn or other agricultural produce, or the raising and rearing of live stock, saving and excepting always the provision hereinafter contained, for the keeping of a register of sequestrations, which shall be held as applicable to all sequestrations, for rent, whether of rural or urban subjects.

III. Whensoever any corn or other agricultural produce shall have been *bonâ fide* purchased by any person for a valuable consideration from the tenant or lessee of any farm or lands, and shall have been actually delivered to the purchaser, and removed from such farm or lands, and the price thereof shall have been paid, or other consideration for such sale shall have been executed, all right of hypothec competent to the landlord, lessor, or person or persons entitled to the rent of such farm or lands, over such corn or produce, shall cease and determine: provided always, that nothing herein contained shall apply to any agricultural Produce which, previous to the completion of the purchase thereof, by the removal of the same from the farm or lands, and payment of the price or other consideration, has been sequestrated at the instance of such landlord, lessor, or other person, and the sequestration whereof has been registered in the register of sequestrations for rent, to be kept as hereinafter provided, and is in force at the time of such purchase.

IV. In the event of the landlord, lessor, or person entitled to the rent of any farm or lands failing to commence proceedings for making effectual by sequestration his right of hypothec within three calendar months after the conventional term at which the rent or any portion thereof is made payable under the terms of the lease, writing, or bargain under which such farm or lands are possessed; or if no conventional term for payment of the rent, or any portion thereof, has been agreed upon, then within three calender months after the legal term at which such rent, or any portion thereof, is payable; then all right of hypothec for the rent or portion thereof payable at such term, conventional or legal, shall cease and determine.

V. In the event of the tenant or lessee of any farm or lands having received and taken thereon, to be grazed or fed, any sheep, cattle, or live stock, belonging to any other person, such sheep, cattle, or stock shall be liable to the hypothec of the landlord, lessor, or person entitled to the rent of the farm or lands, to the extent of the amount of the payment or consideration for the grazing or feeding agreed to be paid by the owner of the same, and no further: Provided always, that so long as any portion of such sheep, cattle, or other live stock shall remain on the farm or lands, the hypothec over the same so remaining shall continue to the full extent of the payment or consideration originally agreed upon for the grazing or feeding of the whole of such sheep, cattle, or other live stock. And that, in the event of the removal of the sheep, cattle, or other live stock, or any portion thereof, from the farm or lands, the right of hypothec shall, so long as the payment or consideration, or any part thereof, shall remain unpaid, continue to apply to such sheep, cattle, or other live stock, to the extent of the amount of the payment or consideration, or such part thereof as shall be unpaid: Provided also that, in the event that the tenant or lessee of any farm or lands, or the owner of any sheep, cattle, or other live stock sent to be grazed or fed thereon, shall be found to have dealt in bad faith, or shall have agreed to receive or pay a consideration illusory in amount, with the view of defeating the hypothec of the landlord, lessor, or person entitled to the rent of the farm or lands, then the sheep, cattle, or other live stock sent to be grazed or fed shall be liable to the hypothec of the landlord, lessor, or person entitled to the rent of the land, to the full extent of the rent for which sequestration could have been used at the time, in the same manner as if the same had belonged to the tenant or lessee of the farm or lands.

VI. In the sequestration for the rent of any farm or lands, as defined by this Act, it shall not be competent to include any household furniture or furnishings, or any agricultural implements; nor shall it be competent, except as hereinafter provided, to sequestrate for the rent any imported manure, lime, drain-tiles, feeding stuffs, or other imported material, not being the produce of, or made upon, the farm or lands, and not at the time incorporated with the soil, or consumed, or otherwise applied to the purposes for which such material may have been procured: Provided always, that where manure of any kind has been brought upon the farm or lands for the purpose of being used thereon in fulfilment of any obligation imposed by the lease, such manure may competently be included among the sequestrated effects: Provided also, that nothing herein contained shall be held as affecting either the right of using sequestration or the description of articles which may be sequestrated, in so far as respects premises and occupations of buildings or of lands to which this Act does not apply.

VII. At each sheriff's or other court where sequestration for rent is or may be granted, a register, entitled the "Register of Sequestrations for Rent" for the particular court, shall be kept by the sheriff-clerk, sheriff-clerk-depute, or other officer of court, having custody of the records thereof, in the form set forth in the schedule appended hereto, or as nearly in that form as may be; and on the granting of any sequestration for rent, there shall be forthwith entered in such register the name or names of the tenant or lessee whose crop or effects are sequestrated, and the several particulars detailed in the schedule appended thereto; and every person shall be entitled, on payment of a fee of one shilling, to search the said register during office hours of every day on which the office of the sheriff-clerk, sheriff-clerk-depute, or other officer of court having the custody thereof, shall be open; and all such fees shall be duly accounted for, and shall be paid by the sheriff-clerk, sheriff-clerk-depute, or other officer receiving the same, to the credit of her Majesty's Exchequer, at such times and in such manner as the Commissioners of her Majesty's Treasury shall from time to time direct.

MANURE.

There are three indispensable requisites for successful farming, viz., draining, cleaning, and manuring. However attentive the tiller of the soil may be to any of these essentials, if one is omitted, or only superficially performed, the labour is, in a great measure, thrown away, and the time lost. But when the land has been laid dry by a proper system of drainage, and the operations of cleaning and manuring attended to with regularity, and thoroughly performed, then, all other things being equal, the utmost return obtainable from the soil may reasonably be expected. Land, when once drained thoroughly, is done for many years, requiring only a little attention in keeping the outlets free and open. When perennial weeds are completely eradicated from a farm, it is comparatively easy to keep clean, when the proper implements for that purpose are provided, and the necessary operations performed with regularity at the proper season. Manuring is totally different. Its claims are constantly pressed into notice, and kept before the mind's eye of the thoughtful agriculturist; and its collection and application must be continued year after year, without cessation or intermission. According to the amount of attention given to this subject by the farmer, so is his success in his calling greater or less. He can substitute nothing in its stead. No amount of labour or personal supervision will stand in lieu of manure; no amount of cleaning or working, although admirable aids, will enable him to dispense with feeding his land. If he tries to do without it, he speedily becomes bankrupt; if he uses it but sparingly, he reaps also but sparingly; and even if he manages to retain his holding, he remains in a chronic state of poverty, having a continual struggle to make all ends meet—it may be, to the end of a very long life. With the farmer who manures liberally money is, on the contrary, always abundant. The rent-day has no terrors for him: he is always prepared for it. His lease, nearing its close, gives him but little anxiety, the landlords of this country in general knowing too well the value of an intelligent and enterprising tenant who spares neither pains, trouble, nor expense in keeping his land in good heart. It is possible such a man may be dispossessed at the expiration of his lease in favour of one whose only recommendation is that he offered a higher rent. Instances of this do occur undoubtedly; but they are the exception rather than the rule.

With able management, and liberal treatment in the way of manure, the poorest land, if it contain at all the elements of improvement, can be speedily changed from having the aspect of a sterile wilderness into fruitful fields, overflowing with fertility, increasing the supply of a nation's food, giving increased employment in districts where, in all probability, it was previously scarce, and richly rewarding the enterprising agriculturist who engages in its reclamation.

The agriculturists of the present day may, and do differ on politics, on religion, and on many things more nearly connected with their business avocations; but, if there is one thing they are at all unanimous on, it is the necessity of applying manure to the fields they cultivate, with no grudging or sparing hand. The never-failing demand for this article manure, the real source of all fertility, renders it scarce, dear, and difficult—almost impossible—to be got in unlimited quantity: its collection in as large a quantity as possible is therefore the constant aim of every cultivator of land who has his own true interests at heart.

The subject being one of peculiar interest and primary importance to every occupier of land however extended, or however circumscribed, and as the present season is that during which the majority of farmers are diligently collecting their manure heaps, and adding to them in every possible way that lies within their power, we propose making it the basis of a few plain and practical remarks. We shall notice, *first*, farmyard manure, its sources and best modes of yearly increasing its bulk, so as to enable the farmer either to extend the breadth of land manured, or to give the same quantity a more liberal dressing; *second*, the external aids to home-made manure within his reach. These are numerous and exceedingly valuable; and as we proceed we shall notice the most important of them, the best modes of using, and the results so far as we are able to testify from our own observation and experience. Farmyard manure properly so called is the manure of animals fed in houses or sheds, mixed with the straw or other substance which has been supplied as bedding. When the animals are well fed, and the food supplied of a highly nutritive character, the dung thus made is the very best quality attainable; and admirably suited to impart fertility to the land on which it is applied. This manure, however, is not always applied to the fields in the comparatively pure state in which it is made under the animals, but is generally mixed with other substances to increase the bulk. These substances although they may not to a great extent contain the elements of fertility themselves, yet when they are of such a nature as to absorb and retain the moisture which farmyard manure so abundantly contains, the bulk of manure can be greatly increased, the breadth of land gone over augmented in a corresponding ratio, and the quality of the heap not in the slightest degree diminished. The substances most suitable for mixing with farmyard dung are those which are rich in organic matter, as in that case they are not alone useful for what they receive and retain from the dung-heap, but contain in themselves a large amount of the elements of fertility. There cannot possibly be found a better foundation for a dung-heap than the earth dug out from the headlands of a field, within a few feet of the fence, or just exactly the brow or collar which the plough cannot reach. On a large field a great number of loads can be obtained from this source alone; and heaps of weeds being formed there from time to time, much of it is rich vegetable mould. A few hundred cartloads of such earth, wherever procured, placed at the bottom of a dunghill, absorbs the moisture as it drops down; and when turned and properly mixed before application, as all dungheaps should be, whatever their contents, the entire heap is rich in the elements of nutrition. Weeds previous to seeding are generally highly recommended as a source of manure; but as their presence in such quantity as to be of much value for this purpose is not a symptom of good farming, it is to be supposed the careful farmer will scarcely depend very much on such a source for increasing the bulk of his manure heaps. Leaves are to a certain extent available; but previous to mixing with the dung are much improved by having been formed into large heaps by themselves, and allowed to remain until pretty well rotted before being mixed. When thrown on a dunghill in the autumn and beginning of winter, they are apt to remain quite fresh, and will be of comparatively little practical utility. Used in this way, too, they sometimes contain the larvæ of insects, which, emerging from the chrysalis when the manure is put out in spring, often prove destructive to the turnip and carrot crops. To avoid such a casualty, it is therefore better not to use them in any quantity until they have been considerably decayed. To avoid all risks it is better to allow a year to elapse before using them. In some districts sea-sand is largely used to mix with the manure from the yards and stalls, it being thrown plentifully under and behind the cattle, soaking up the liquid, and in a great degree preventing it from running to waste. Where straw is scarce, it is useful in its place, as it is warm and dry, and the animals lie very comfortable upon it. But where straw is plentiful, and the sand is only used to mix with the manure for the purposes of increasing the bulk, the object is defeated, as the sand cuts the straw, greatly lessening the bulk during the time it remains in the heap. Under such circumstances sea-sand is better spread out on the field as it is drawn from the shore, thus saving a great deal of labour in carting; and as the influence of sea-sand is almost purely mechanical, nearly all the good it is capable of doing is got by this means. Land dressed with this material previous to being seeded with wheat is greatly benefited thereby, the amount of produce being increased, the quality improved, and the straw greatly strengthened, and enabled to stand better. Seaweed is another excellent manure, which the extended coast-line of this country furnishes in enormous quantity; and one which the farmers, situated at and convenient to the coast, are not slow to avail themselves of. By some farmers it is thrown on the dung, and mixed up with it in the usual manner; but this is a wasteful practice, as it melts away, and its effects are scarcely appreciable. When spread on the soil and covered lightly in, its value is considerable. Spread on grass-land, and allowed to melt into the soil under the influence of the weather, it makes a capital top-dressing: the results of this mode of using seaweed being considered by many farmers as the maximum obtainable from its application. For potatoes and turnips it is a good manure, the crops being sound and of good quality; but its effects scarcely reach farther than the crop to which it is applied.

Having thus shortly glanced at the substances within reach of the farmer to mix with, and consequently increase his supply of farmyard manure, we shall now review the best modes of creating and maintaining a large and regular supply of the genuine article itself. The first requisite for this purpose is plainly an abundance of food; and next, a plentiful supply of straw for litter. Without plenty of straw it is obvious that there cannot be great bulk of manure, however well the cattle may be fed; and bulk is absolutely necessary when the extent of land to be gone over is considerable. On the other hand, when a great quantity of straw is trampled into manure the quality is very indifferent, and contains scarcely any of the constituents necessary for the sustenance of vegetable life; and its effects on light friable soils are therefore rendered almost nugatory. On heavy clays, however, poor strawy manure is of more value, although for quite a different reason. On such a soil it acts mechanically, keeping it open, and allowing it thereby to benefit largely from the action of the atmosphere. On heavy corn-growing soils, where the system of summer fallowing still prevails, and where during the winter the cattle receive but a very small portion of turnips, often none, the manure made is very poor indeed. The cattle are kept not so much with the view of profit as for treading the immense quantity of straw grown on such farms into manure; and during the entire winter large numbers of store beasts get nothing but straw and water. The straw being given *ad libitum*, the animals pick out the choicest portions, treading the rest under foot; and if the yard in which they are enclosed is only moderate in its dimensions, they speedily raise themselves to a level with the top of its walls. When the manure thus made is spread on the fields, and as often happens is permitted to remain some time spread before an opportunity occurs for getting it ploughed in, its poverty is clearly discernible, as if the weather is at all dry the straw of which it is composed assumes nearly its original form. When, however, it is ploughed in during the months of September, October, and November, the land is kept open for the action of frost and other atmospheric influences, and in spring works as kindly and becomes as thoroughly pulverized and disintegrated, and finishes off with a skin as fine as the lightest land in the kingdom. The wheat crop grown on such soils, and with no other manure than that now described, is for quality and quantity second to none. The best quality of farmyard dung is unquestionably that which is made in boxes, sheds, or courts; the animals not tied, but allowed to move about at pleasure, and supplied with plenty of food, both bulky and nutritious. The quantity of manure made in a box tenanted by a pair of bullocks is enormous, and as the heap is consolidated by the treading of the animals, fermentation is checked, and the ammoniacal gases retained. The urine being also in a great measure absorbed, nothing is wasted, and a heap of manure, large in quantity and unequalled in richness, is accumulated in a very short space of time.

When proper arrangements have been made, by sinking the floors of the boxes somewhat under the ground level, it is much better not to clean out too often, but only at extended intervals, as in every case the larger the heap the better the quality of the manure. The warmth imparted to the animals when there is a considerable thickness under them tends much to their improvement, and when regularly supplied with straw they will never dirty themselves, and their coat, *self-cleaned*, has the peculiar gloss and healthy *swirl* so eminently suggestive of all kindly feeding and profitable cattle. Were it at all times practicable, manure thus made might with great propriety be conveyed direct to the land and ploughed in. When this cannot be done it is better to clean out the boxes simultaneously, build up into a square heap, and cover with earth to a considerable thickness, so as to retain the volatile gases, and prevent loss by evaporation. Feeding cattle in boxes, courts, or hammels—as the different modifications of the system are variously termed—has so much to recommend it, that it is surprising it is not more generally adopted. There is scarcely any expense incurred by a landlord that his tenant would more cheerfully pay a smart interest on, than as the money laid out in building sheds, divided and arranged for box-feeding. The benefits derived by the extra improvement of his beasts, and the enhanced value of the manure made by them, would enable the farmer easily to do so, and leave a considerable margin besides for himself.

To keep up a constant supply of home-made manure, a partial system of house-feeding during the summer months can be followed up. We say partial, as it is not advisable to shut up cattle completely during the summer. Young cattle are extremely liable to affections of the joints from the want of exercise during the period of growth; and cattle of all ages are much more disposed to tubercular disease when confined all the year round, than when allowed a certain amount of liberty. In the height of summer store and feeding stock can be housed during the day and in the fields at night, greatly to their own comfort, as indoors they have protection from the sun and immunity from the attacks of insects. Dairy stock can be confined to the stalls during the day when the sun is so hot, and the attacks of insects so tormenting, as to prevent their feeding in the fields, and at all times they may be allowed to rest after filling themselves morning and evening. When well bedded and liberally supplied with food, the amount of excellent manure thus made during the summer and autumn months will be considerable. When cattle are highly fed indoors with nourishing and succulent food, the manure dropped by them on the pastures is an immense deal more valuable than it would be if they depended on the pastures alone for food. Dairy stock are objected to by many farmers for the sole reason that they have a tendency to deteriorate the pastures by carrying away such a quantity of phosphates. In this case the supply of food is not merely local, a large, if not the greater, portion being derived from other sources, and the tendency is reversed, being to enrich rather than impoverish. In practice this can be easily proved, as the grass fields of those farmers who have house-fed regularly for a number of years may be seen green in the middle of winter, and the bite obtainable by the stock quite as good as that which they had in summer. Let a man place his heel on such land during the driest time of the year, and it will leave its impression. The supply of food requisite is within the reach of most farmers—not all in the same sense, as the southern farmer has a great advantage over the northern in being able to sow crops in autumn, with a reasonable prospect of their standing the winter and coming into use early in the year. Thus, tares, rye, and trifolium can be sown in September, and cleared off by the middle of June in time for turnips, and the land in no way injured, but on the contrary much improved, if the stolen crop has been liberally treated. All practical men are aware that a large leaf-bearing crop is more nourishing to the soil on which it grows than exhaustive; so that the heavier such a crop can be grown, the more beneficial are its results; not only with regard to the immediate value of the crop grown, but also to the land. Note, in proof, the rich, almost black, colour of the soil, when turned up, on which a heavy crop of vetches has been grown, and the heavy crop of turnips that will follow with a mere sprinkling of guano or other concentrated manure to force forward the young plants, so as to get the full advantage of the short period of growth to which in general such a crop is limited. When a farmer has once got the system of successional crops properly organised and fairly set a-going, he does not find the slightest difficulty in keeping it up, each crop coming in as naturally and with as much regularity as the months follow each other. Thus, white turnips come in about the middle of August; Dale's hybrid and Aberdeens follow; swedes keep up the succession till April; mangolds following run the supply well into the summer, leaving a period of something about three months, for which tares, Italian ryegrass, clover, &c., will form an ample connecting link. With abundance of food at every season, the supply of manure will be so plentiful, as to make the farm on which it is carried out so rich as to become a very apt illustration of a good roast of beef, which, in the cooking process, supplies sufficient gravy to baste itself. The corn crops which follow will not only be vastly richer in the amount of cereals produced, but the straw will also be so much increased, as to become a positive boon to the producer, giving a supply of this to him most invaluable material all the year round. For holdings of moderate extent, the supply of manure thus obtained will be so plentiful as to in a great measure preclude the necessity of external aid. On extensive farms it can only be managed when there are feeding sheds on different points of the farm. Under any other circumstances it becomes impracticable, on account of the extra labour involved. The large farmer therefore seldom has the power or opportunity of manufacturing at home all the manure he requires in the course of the season, but must look to other sources to supplement that made in stalls, boxes, and yards. This brings us to the second part of our subject—viz., the aids to home-made manure within reach of the farmer. Those are so numerous that, *capital* permitting, no one need be without manure of some kind or other. We shall notice in succession whatever is really worth the attention of the agriculturist. The first that suggests itself is one that can be taken advantage of by every farmer whose soil is capable of growing turnips, however inaccessible the situation, or however remote from the farm-buildings. Wherever there are a few inches of soil, a good, nay, often an excellent, crop of turnips can be grown with the aid of portable manures; and the crop being eaten off with sheep, the field is thus manured and put in good heart, without a single load of manure having been drawn to it. This system, now so universally adopted, is one of the most valuable aids to profitable husbandry of which modern farmers are possessed. Thousands of acres have been brought into cultivation with its assistance, many of which would otherwise have remained in a state of nature. Far up on the sides of hills, to as great an altitude as the turnip will profitably grow, the heather and coarse mountain-grasses have been displaced, and the valuable cultivated grasses suitable for such situations now flourish in their stead. At the same time, the less profitable, though more hardy breeds of sheep have been displaced, to make way for the introduction of the more improved varieties; and now valuable crosses, and, in numerous instances, full-blooded Leicesters are fed and prepared for the butcher, where previously nothing but store stock could be kept, and those, too, of the hardiest description. The advantages of this system are not, however, confined to the upland farmer only, as it is equally applicable to the lowland farmer, who, by availing himself of the advantage it offers, can vastly increase the production of corn, beef, mutton, and wool on his farm. When sheep-feeding on turnips is adhered to as part of the system, every portion of the farm can be worked in the rotation, not a single field requiring to be omitted on account of distance, steepness, or lightness of soil. Distance in this case is annihilated, as far as extra labour is involved, the sheep once placed in the nets distributing the manure evenly over every portion of the field. Steepness forms but a very slight difficulty—none, as far the sheep are concerned; and horses will keep their feet in ploughing the side of a hill so steep, as to be a matter of wonder to the uninitiated how they can possibly manage it. Thin sharp soils are greatly improved by the consistency which the treading of the sheep imparts to them, and valuable crops of wheat follow on land where its culture could not otherwise be attempted. Although a farmer may not be rich enough to purchase a flock of sheep to eat off his turnips after he has them grown, he need never be at a loss about getting his field manured, as in nearly every district plenty of graziers are to be found glad to get the opportunity of hiring a field of turnips, paying a good price for the privilege, doing all necessary labour in cutting the turnips, &c., and giving the owner not the slightest trouble. This is an admirable division of labour, and is eminently suitable and conducive to the interests of both parties. When the sheep are in the nets, they are sometimes permitted to scoop out the turnips as they grow, without any preparation, the attendant pulling out the shells to enable them to be eaten up clean. The modern plan is to clean the turnips, cut them into suitable pieces, and place them before the sheep in troughs. By the former plan the field is more regularly manured, and the full benefit obtainable from feeding with sheep is obtained. The latter mode has the advantage of bringing on the animals somewhat faster, and is moreover commendable on account of increased cleanliness and comfort to the animals. When corn and cake are given in the troughs, the land is considered to be so much improved by the superior richness of the manure, as in a great measure to repay the extra outlay involved by the purchase of concentrated food. The leading fertilizers within the reach of the farmer, and of which he can avail himself to any extent, without in a manner going beyond the boundary of his own farm, having now been noticed, the first external source of manure that presents itself is obviously that derived from the streets and backyards of large towns and cities. This manure is necessarily composed of a great variety of different substances, some of them containing but few of the constituents necessary for the healthy development of vegetable life, doing little more than adding to the bulk of the material of which it forms a component part. Pure street or police manure, as it is variously termed, is an excellent dressing for land, and well repays the outlay incurred in its application. Pushing men whose farms are situated in the vicinity of large towns, or reasonably near to a railway station in connection with a large town or city, the latter now-a-days being nearly as advantageous as the former, avail themselves largely of the facilities thus afforded, and purchase immense quantities of this manure. In every district there are farmers notably prosperous, and whose success in business is so marked as to attract general attention. In many cases the foundation of their success is the partiality they display for this manure, their horses being almost constantly on the roads drawing it, and miniature mountains of it piled up in the corners of the fields ready for use. It is noteworthy that all the men who use it extensively are prosperous; we have heard an old farmer say, that in the course of a long life, he never saw a farmer sold out who used town manure to any extent on his farm. For all crops it forms a suitable dressing—beans, wheat, and green crops; and being to some extent a concentrated manure, it affords nourishment whenever the plant is capable of absorbing it. As a top-dressing on meadows after the hay has been removed, it suits admirably, nourishing the exhausted roots of the grasses, and bringing away a magnificent crop of after-grass. Towns also supply a large amount of horse-dung, from the stables of gentlemen, livery-stables, barracks, &c. A good deal of this is so dry as to suit capitally to throw into yards under store cattle, and is by them trodden into excellent manure. Slaughter-house dung is also much sought after, and is of course a powerful manure; but its effects if unmixed are not lasting, and the crops manured with it are often injured by excessive luxuriance, the roots of turnips, for instance, bearing no proportion to the foliage. Amongst bulky manures, lime, the most important of all the mineral manures with which agriculturists are acquainted, takes a very prominent part. It is only second in importance to farm-yard manure itself, although totally different in its action. Practical men are very much divided about the influence which lime exerts upon the land on which it is applied. Some maintain that it is merely a stimulant, and owes its fertilizing powers solely to the property possessed by it of reducing inert vegetable matter to a nutritious form. Others assert that it is in itself a manure, and use it as such; but it is absolutely certain that any one using lime as a continuous dressing for land, unless some other ingredient is mixed with it, will ere long reduce the soil on which it is so used to a state of absolute sterility. On newly reclaimed land lime is invaluable, as it hastens the decomposition of the roots and useless herbage which formerly had possession of the soil, converting into excellent manure what previously was of no value whatsoever. To have land in a high state of fertility, it is absolutely necessary that lime should be present in more or less quantity, according to the nature of the soil, as it enters into the composition of all the cultivated plants, particularly the cereals. Often when a farmer, who is otherwise a good manager, finds that, notwithstanding all his care and abundant manuring, his corn crops are yearly going back in the amount of yield, the cause is very frequently traceable to want of lime; and when a dressing of this is applied, the fields are at once restored to their wonted fertility. On light land lime must be applied with much caution, as it will, if applied too hot or in too great quantity, not only destroy the first crop that succeeds its application, but the land will not recover the injury inflicted for a number of years. When it can be economically managed, by far the best plan of applying lime is to slake it on the head-land, turning it once or twice, and then putting it out in small heaps, or spreading it from the carts. Wet weather interferes very much with this mode, and causes a considerable amount of extra labour in bringing fresh lime to mix with that which has been run into mortar. The most economical plan of applying lime is to lay it out on the field in small heaps as it is drawn from the kiln, cover with earth, mix in a few days, then spread whenever it is sufficiently reduced, and plough in. The smaller the heaps the better, as less injury is done to the soil by burning, a contingency which no management can avoid, if the heaps are made at all large. When applied to ploughed land, the lighter it can be covered in the better, as the tendency of lime to sink and get out of reach cannot be overcome. On this account the grubber and harrow suit better for mixing lime with the soil than the plough. In all composts for top-dressing, lime is one of the principal ingredients, and answers admirably as a restorative to worn-out pastures that it is not convenient to break up. It kills moss and the coarser grasses, and brings away with a rich green colour the more valuable portion of the herbage. Lime and earth applied to poor pasture previously to being broken up for oats greatly improves the corn, both in quantity and quality, and is a capital preparation for the succeeding green crop. Applied to potato land, and worked up with the soil before drilling, it greatly improves the quality of the produce, and to a considerable extent lessens the loss from disease. We have thus noticed the leading manures available or within the reach of most farmers of the present day, but the sketch has unavoidably been short and imperfect compared with the interesting nature of the subject. Many things containing a great amount of fertilizing power have been left unnoticed, the most prominent of which is liquid manure, the merits of which alone would require a treatise to discuss. The necessities of the British farmer for manure are not yet so urgent as to compel him to attach so much importance to this subject as it deserves. On many farms a pump will be found in connection with the dunghill, which is dignified by the name of the Liquid Manure Pump; but its powers in most cases are very seldom brought into requisition. The day may come when the importance of urine and sewage as fertilizers may be forced more prominently before the mind of the agricultural public; but at present the greater part of the agriculturists of this country pay no attention to the matter whatsoever, the labour connected with its distribution having undoubtedly something to do with this indifference. We cannot close without saying a few words about that class of fertilizers, generally styled portable or concentrated manures, and which include bones, guano, superphosphates, nitrate of soda, and some others of a like nature. Used in conjunction with farmyard manure these manures are productive of the most gratifying results. Some crops, as for instance turnips to be eaten off with sheep, may with great propriety be grown entirely with these manures; but under any other circumstances the land must suffer. A judicious use of the leading ammoniacal and phosphatic manures puts the farmer using them in an exceedingly advantageous position, and it may be taken as an admitted fact that the more money he spends on those manures (always supposing that it is spent wisely), the more wealthy and prosperous will he become. The best land treated with a full allowance of farmyard manure amply repays a little additional outlay in the shape of Peruvian guano, as the seeds, particularly that of the turnip, finding nourishment which it can at once assimilate, makes a quick growth, and gets much more rapidly out of reach of the fly. Land deficient in phosphates is greatly benefited by a few cwts. of superphosphate and a little guano mixed, the guano starting the crop into active growth, and the phosphate carrying it on to maturity. Ground bones are largely used, both by themselves and in connection with farmyard manure, in the cultivation of green crops. Mechanically reduced, their action is very slow when compared with the results obtained from the same weight and value reduced chemically; but this very fact admits of a larger dressing being given at one application; and the good effects of the bones will be felt not only by the turnip crop, but by the corn and the grass which succeeds the corn, the latter never failing to show where the bones have been applied, by the intense green colour and superior vigour over any portion of the field which has not been so dressed. Corn crops are particularly grateful for a light dressing of ammoniacal manure, and in most years will pay the outlay by the extra weight of straw produced by its influence. The increased quantity and quality of corn will, unless in a very wet year, be equal to once-and-a-half the amount originally expended. Three cwt. of guano and two cwt. of superphosphate sifted fine and carefully mixed, and applied as a top-dressing for wheat at the rate of not more than thirty shillings worth to the statute acre, is a capital dressing, and gives excellent results. We imagine that the utmost benefit to be obtained from this manure is got when applied simultaneously with the sowing of the wheat, as when the plant has got a good start it almost invariably maintains a superior vigour during the whole period of growth. If, however, any one wishes to see the immediate effect of such an application, he can gratify himself by dressing a weak part of his wheat in the spring and harrowing it in, then pass the roller over it. The effect will be almost magical, the young plants assuming in an inconceivably short space of time a rich healthy colour, tillering out vigorously, and soon taking precedence of the undressed portions of the field, however superior they may have previously been. With plenty of capital for the extent of land he holds, the farmer has many ways of laying it out profitably; and when, all other things being equal, he keeps up an abundant and never-failing supply of food in the shape of manure, he will scarcely ever fail to be rewarded with a reasonable amount of success. S.

THE ROTATION OF CROPS.

A LECTURE BY MR. JOSIAH MITCHELL, OF THE EXPERIMENTAL FARM, ROYAL PARK, MELBOURNE, DELIVERED AT BRUNSWICK, AUSTRALIA.

I am here this evening for the purpose of delivering a lecture on what, I fear, you will scarcely consider a popular subject, namely, "The Rotation of Crops." Conversing one evening with the Rev. Mr. McVean on the various progressive phases of development that take place on the surface of the globe, ere it becomes fitted for the support of man, it was suggested by him that my remarks, thrown into the shape of a lecture, and delivered here, would be useful and interesting. I agreed to try what I could do, and will endeavour, to the best of my ability, to elucidate the subject.

"Rotation of Crops," as I have already said, is not a popular or taking title; it savours too much, I have no doubt, of the humdrum plodding toil of farming life. The "Battle of the Bible," "Hugh Millar," or "A Night with Burns," would be more likely to catch the popular ear; yet it is a subject fraught with deep interest to the student of Nature, who can find "tongues in trees, sermons in stones, and good in everything." It has much to do with the well-being of man, and is of the greatest importance to all those who are engaged as "tillers of the soil."

Through the agency of plants, and by the natural rotation of crops, or successive generations of vegetable life, the earth's surface has become fitted for the sustenance of men, "lords of the creation," and women too, "fairest and best of all God's works." Hence it is that a thorough knowledge of this clearly defined natural law is essential, to enable those who cultivate the soil to maintain its fertility. Plants, unlike animals, derive their support from inorganic or mineral substances, and from certain elements contained in the atmosphere, although their growth is stimulated and increased by the decomposed remains of both the animal and vegetable kingdoms. Animals, on the contrary, derive their nourishment from matter that has undergone previous organization in the form of plants or animals. But we shall be better able to comprehend the marvellous and beautiful harmony that exists in the economy of Nature, if, in imagination, we take a backward glance "through the dark posterns of time long elapsed," at the origin of soil, and the progressive development of vegetable life on this island continent, now the adopted home of civilized man. First of all, then, let us imagine, if we can, the upheaval of this vast island from the depths of the ocean, by that mighty, that irresistible and mysterious force generated in the interior of the globe, and by us termed volcanic. Mountain summits appear above "the wild waste of waters," in all the sharp angularity of outline belonging to newness of formation, there to undergo the weathering action of light, heat, air, and moisture; or, in other words, to be mellowed and softened by the hand of Time. Volcanoes belch forth fiery streams of molten rock, and liquid gold runs in veins of quartz. The process of upheaval, and the mouldering down, or, as chemists term it, the "degradation" of rocks, goes slowly on. Meanwhile, floated by the wind, sporules, or, as they may be called, invisible seeds of lichens, liverworts, and mosses, fix themselves on, and quickly cover the surface of the rocks. Then commences the era of vegetable life. These lowest forms of vegetable organization derive their chief support from the atmosphere; but they possess the peculiar chemical property of, as it were, manufacturing an acid, which acts through their tiny rootlets as a solvent of the minerals composing the rocks on which they grow. The mineral substances thus dissolved enter into the system, and become part of the plant. These plants, after fulfilling their allotted period of existence, perish and decay, thereby preparing the ground for a succeeding generation. Thus, generation after generation of different kinds of plants succeed each other, each tribe higher in the order of organic structure than its predecessor. The accumulation of vegetable matter, containing mineral ingredients in a most minute and finely subdivided form, increases rapidly. In the course of time the hills and valleys become clothed with a mantle of richest green, studded with flowers of every form and hue, created to please the eye and gladden the mind of man; rising through successive tribes of annual plants and grasses to those of more permanent character and form, then to shrubs and trees, the dense and tangled underwood, and the mighty monarchs of the forest. The oaks rear their wiry forms, through which the wind sighs with melancholy sound, and gum-trees hang their flint-covered leaves, to break and modify the force of the scorching blast. For, along with the progressive development of vegetable life, comes modification and amelioration of climatic conditions, both as regards dryness, force of winds, and amount of rainfall. Geographical and geological peculiarities hasten or retard these changes; but ultimately, what was once a barren island of rocks and stones becomes fitted, in climate and soil, for the residence and sustenance of man.

Thus we see that all those various changes take place on the surface of the globe through the agency of vegetable life—successive tribes forming, as it were, a rotation of crops, and by this means converting the inert, hard, indigestible rock into wholesome life-sustaining food for man, at the same time exercising such a modifying influence on the climate as renders existence enjoyable. Such was this country when the first plough-furrow was turned beneath its azure sky. But alas, ever since then, intelligent man has ignored the laws of Nature, and in a few years will undo—nay, has in fact already, in too many instances, undone—the work of ages. If a farmer commences to clear the timber off a field, and cart it into Melbourne, we naturally conclude, because it is evident to our senses, that after a time, according to the rate at which the timber is carted away, the whole of it will be gone. The trees took a long time to grow: they are quickly cut down. It would require a long time for other trees to attain to the same size. Now, precisely the same thing happens to the mineral and vegetable substances which give fertility to the soil as happened in the case of the timber, when the cultivator begins to take crop after crop of the same sort of grain or hay, without intermission, without change, without manure; although in this case the result is not so self-evident, and is not believed in. But gradually decreasing yields—until at length a point is reached at which cultivation will not pay—proclaim the truth that the soil's fertility, like the timber, has been carted away. Our cultivation—system it cannot be called—without a rotation, without manure, is simply spoliation, resulting in exhaustion. The sooner we change, and adopt a more rational practice, the better; for we cannot rob the land, inert and passive though it lies, with impunity. The day of reckoning will come: "Our sins will find us out;" indeed they are fast finding us out. Yet there are many extenuating circumstances that may be advanced, especially by tenant-farmers. The land offers a tempting investment for accumulated capital. The capitalist, when he purchases the land, has no traditional history handed down through generations long—no hallowed memories of "auld lang syne" in its grassy slopes and wooded dells. He is not "bound by Nature's bond" to

> "Its mountains blue and melon-skirted streams,
> Since childhood loved, and dreamt of in his dreams."

It is to him an investment, and nothing more. He lets it unconditionally to "the highest bidder." The tenant pays for the privilege, and, acting in obedience to his self-interest, takes all he can out of the land. It matters not to him if the land is exhausted when his lease expires. He moves to virgin soil, to commence anew the work of spoliation. In this way capital obtains a high rate of interest at the expense of the community. In principle, it is the same as "bubble companies" paying large dividends out of paid-up capital. It may be said this is a condition of things inseparable from the settlement of a new country. Perhaps it is, but I do not think so. The same thing took place in America, and with like results; but it is now costing the modern American cultivator more to restore the land than his predecessor got for the produce that reduced the land to barrenness. Therefore I think it would be cheaper and wiser to keep the fertility of the soil when we have it, than to bring it back again at large cost after letting it slip through our fingers. Besides, we only hold the land in trust, as a means of obtaining our sustenance, and ought to hand it down to posterity with increased rather than impaired fertility. The example of America ought to be a warning to us to avoid the rocks and shoals of barrenness, because *we* have no "far west" to fall back upon. I will here quote Johnston's graphic description of the American system, and its consequences, as given in the "Chemistry of Common Life." He says: "But man also exercises an influence on the soil, which is worthy of attentive study. He lands in a new country, and fertility everywhere surrounds him. The herbage waves thick and high, and the massive trees lay their proud stems loftily towards the sky. He clears a farm from the wilderness, and ample returns of corn pay him yearly for his simple labours. He ploughs, he sows, he reaps, and from her seemingly exhaustless bosom the earth gives back abundant harvests. But at length a change appears, creeping slowly over and gradually dimming the smiling landscape. The corn is first less beautiful, then less abundant, and at last it appears to die altogether beneath the resistless scourge of an unknown insect or a parasitic fungus. He forsakes, therefore, his long-cultivated farm, and hews out another from the native forest. But the same early plenty is followed by the same vexatious disasters. His neighbours partake of the same experience. They advance like a devouring tide against the verdant woods, they trample them beneath their advancing culture, the axe levels its yearly prey, and generation after generation proceeds in the same direction—a wall of green forests on the horizon before them, a half-desert and naked region behind. Such is the history of colonial culture in our own epoch; such is the vegetable history of the march of European cultivation over the entire continent of America. No matter what the geological origin of the soil may be, or what its chemical composition; no matter how warmth and moisture may favour it, or what the staple crop it has patiently yielded from year to year, the same inevitable fate overtakes it. The influence of long-continued human action overcomes the tendencies of all natural causes. But the influence of man upon the productions of the soil is exhibited in other and more satisfactory results. The improver takes the place of the exhauster, and follows his footsteps on these same altered lands. Over the sandy forsaken tracts of Virginia and the Carolinas, he spreads large applications of shelly marl, and herbage soon covers it again, and profitable crops; or he strews on it a thinner sowing of gypsum, and, as if by magic, the yield of previous years is doubled or quadrupled; or he gathers the droppings of his cattle and the fermented produce of his farm-yard, and lays it upon his fields, when lo! the wheat comes up luxuriantly again, and the midge and the rust and the yellows all disappear from his wheat, his cotton, and his peach-trees. But the renovator marches much slower than the exhauster. His materials are collected at the expense of both time and money, and barrenness ensues from the easy labours of the one, far more rapidly than green herbage can be made to cover it again by the most skilful, zealous, and assiduous labours of the other." Such is the system in America, and such, I am sorry to say, is our own. We have here presented to us the picture of man as the destroyer, and man as the restorer of natural fertility; the latter by far the most agreeable to contemplate, Now, what I would see in this country is, man as the *retainer* and *improver*. As I have already said, we have no "far west" to fall back upon and render desolate, but we have a good foundation of grass to build upon, if we only turn it to proper account. We have not the European grain market within such tempting and paying reach of us as it is of America; therefore, when once we supply our own wants in wheat, there will not be the same inducement for us to go on exhausting the soil by the growth of grain. But we may, and sooner or later we shall, send butter, cheese, wine, oil, silks, preserved fruits, and cured meats, to the markets of the old world, just as we do now our wool, tallow, and hides. Another cause of the exhaustive system of culture being pursued by us is, that the farms are too small. We want subdivision of farms, greater variety and rotation of crops, and larger farms to get the sure foundation of grass. As a rule, we farm too little, and plough too much. Every one who reflects on the subject must come to the conclusion that the base of all our operations in cultivation in this climate *must be grass*. Entirely overlooking this great fact, too many have settled down upon such small patches of land that they are driven to depend exclusively on the plough, and are thus compelled, in consequence of the high price of labour and the want of manure, to pursue an exhaustive system of cultivation; which means, where the farmer is the proprietor, living upon capital, and the end will come. They want the grass to feed the herd of dairy cows or the flock of sheep—according to the fitness of local conditions —to manure the cultivated land. It is now long since I expressed the opinion—and I have since seen no reason to alter it—that 640 acres of real good land, fifteen or twenty miles from a market, would be but a small farm under the present circumstances of the country. The next in natural rotation after the sqatter, should have come the *farming grazier;* but somehow — whether owing to the land laws, or the want of them, I don't know—we skipped entirely over him, and passed at one bound from the squatter to the farmer pure and simple, with his ploughs and harrows. However, the cultivating grazier is gradually cropping out, and we are, as it were, instinctively finding our way back to the natural rotation as regards men, and I hope, in the course of time, to a natural rotation of crops also. We hear of "large breadths of land being laid down to grass," unfortunately after it has been somewhat exhausted; and of the introduction of sheep in conjunction with cultivation. This is building on a solid foundation. Sheep, coupled with a judicious system of cropping, will render cultivation more profitable and more certain; and the cultivation will increase the profit from the sheep. With ample grazing ground, and a limited amount of cultivation—say one-fifth of such a farm as I have mentioned—by means of the flock of sheep, or the herd of dairy cows, and in some instances the happy combination of both, a portion of the fertility could, without any cost of labour, be transferred from the grass to the cultivated land, with vast benefit to both the farmer and his stock. In this way the land cultivated would always be kept in "good heart:" he would double the amount of his crops, or, in other words, obtain the same amount from half the area of land, at half the cost for seed and labour, to say nothing of saving in the quantity of seed sown; and it is a well-known fact that poor soil requires more seed than rich soil. By returning to the land, in the shape of bone-dust or phosphatic guano, the phosphates taken away in the stock, and grain sold off it, the natural fertility of such a farm would be maintained, might be increased, and larger profits secured, with less of risk.

But the farmer is not the only one who is pursuing an exhaustive system; the squatter, too, is following, at a slower rate, in the same track. Certain mineral constituents are abstracted from the soil, and driven away in the bones, wool, and flesh, of every flock or herd sent to market; and notwithstanding the opinion of the Honourable Mr. Fellows that "the grass will grow again, but the gold will not," the station is left so much poorer in substances necessary for the production of future sheep and cattle, just in the same way as our auriferous ground is rendered poorer by the miner. Therefore, Mr. Fellows made a distinction where there is no difference. I have read of stations in the New England district of New South Wales, formerly celebrated for the production of the best description of grasses, now being abandoned in consequence of worthless and troublesome grasses taking possession of the soil, the better sorts having died out. Why have the good grasses disappeared, and given place to worthless varieties and weeds? This is a question of some interest to the squatter. Is it that the surface soil is exhausted of the mineral food necessary to support the good varieties? According to the late Dr. Macadam, our soil is deficient in phosphates. However this may be, through the use of bone-dust as manure, the lost fertility of the station, in part, finds its way to the farm, and thus the cultivated land of the colony is enriched by the grass land, the farm utilising the waste of the station; just upon the same principle, that, in my opinion, ought to be carried out on the farm itself, as well. To farm rationally and profitably, we must have stock of some sort on the farm; to keep stock, we must have grass. Under present circumstances, the grass land ought to be by far the largest portion. The proportion of cultivation would naturally increase with the increase of population. "To meet the times," we want farms sufficiently large to admit of a combination of grazing and cultivation; and then, with care exercised in collecting, decomposing, and applying to the soil all refuse animal and vegetable matter, with the occasional purchase of phosphates, coupled with rotation of crops on the cultivated land, we should have no reason to deplore the gradually decreasing yields of grain and loss of fertility, caused by our present system of exhaustive culture. I have seen it stated that manure is productive of injury, rather than of benefit, to crops in this climate. Surely it must have been the condition of it, or the season, or the crop to which it was applied, and not the manure, that was in fault. Manure should be plant food; and surely plant food, wisely administered, will not injure plants. It is true we have much to learn yet in this climate in reference to the best mode of preparing, and the best season for applying manure; but it is altogether absurd to say that, properly made and applied, it would prove injurious. However, I have never yet heard any objection raised against a rotation of crops; and it being a law of nature— but, indeed, manuring is that also—we shall act wisely by taking advantage of it as a means towards an improved system of cultivation. "Plants," says Carpenter, in his "Vegetable Physiology," "not only draw various substances from the soil, but impart to it a portion of the juices which they have formed within themselves. A well-marked instance of this is the oak (our own wattle possesses similar properties), which so completely impregnates the soil around its roots with with *tannin* (the substance which gives to oak-bark its peculiar power of converting animal-skin into leather) that few trees will grow on the spot from which it has been rooted up; since this agent, even when a very minute quantity of it is dissolved in water, produces an effect like *tanning* on the delicate tissue of the points of the young roots, and destroys their peculiar properties. It is probable that every species of forest-tree produces a similar effect; since it is well known that when a wood composed of one kind is cleared by the hatchet or by fire, the new growth, which soon springs up, is not of the same, but of a different species. The excretions of all plants seem injurious to themselves, as well as to others of the same species grown on the same spot; and in many instances, as in those just quoted, they are injurious to plants of other tribes also. But there are many instances in which they are absolutely beneficial to plants of distant tribes. Thus, most of the leguminous tribe (that is, peas, beans, vetch, &c.) exude from their roots a matter analogous to gum, as may easily be shown by growing a pea or a bean in water, which soon becomes turbid; and this product is beneficial to plants of almost every other tribe. Hence, therefore, the benefit which the farmer derives from taking off a crop of beans between two crops of corn is not restricted to the value of the bean crop, since the succeeding crop of corn is absolutety improved by this proceeding; and, on the other hand, the exhaustion of the soil by rank growing weeds is not their only evil, since they impart to it some of their own injurious properties. Now, by following out this system, and ascertaining what plants form the most abundant, and at the same time the most nutritious secretions, and what are the other plants most benefited by these—keeping in view also the nature of the mineral ingredients they may respectively require—the agriculturist may hereafter be able to dispense almost entirely with artificial manure, as he has already done with the bare fallowing system; for he will only have to adapt his rotation to the particular soil, and then the excretion of one plant will serve as manure for the other." Now, I would not like to go the length of stating that any rotation of crops would render it unnecessary to return phosphatic manures to grain-producing soils; for our rotation is limited by climate, and by the requirements of the community. But this I will say, that it is a natural ally, and too valuable an auxiliary to the dung-heap for farmers in the country to neglect taking advantage of it; and if the farmer only directs his attention to the subject, the most advantageous rotation for the various districts of the colony will soon become established from practical experience. In no other way can we arrive at a knowledge of the most suitable rotation. "The general principle to be kept in view in any rotation is, that a plant with a naked stem and farinaceous seeds should follow one with a branching stem and fleshy root, which has been taken from the ground by mowing or feeding before the seed was ripe; or, if all these conditions cannot be obtained, some of them at least should be complied with." More than this it would be useless for me to attempt; for the rotation must be fixed according to soil, situation, and requirements. The rotation that I myself have adopted is—first, oats; second, green crops, chiefly mangels, heavily manured; third, oats; fourth, grass; fifth, grass. The oats are cut for hay, and the grass pastured —my object and interest, owing to position, being crops bulky of carriage, and milk. The rule to be strictly observed in the adoption of any rotation is, how to obtain the greatest amount of produce without diminishing the fertility of the land. I might here quote some of the best rotations, as carried out in England, but I fear it would serve no good purpose. My object is simply to point out the necessity and advantages of adopting some rotation; but practical experience —by far the safest guide—must decide what it is to be. From the nature of this climate, in ordinary seasons, I am of opinion that what may be termed intermediate green crops will form part of our rotations—that vetches, turnips, mustard, or rape, will be sown broadcast on stubbles, after the land has been stirred with a grubber, and either fed off in early winter, or ploughed down as green manure: the crop, after it is up, receiving a top-dressing of Peruvian guano to force the growth, and thus obtain as much bulk as possible from the atmosphere. The natural rotation or change of crop, and its beneficial effects in enriching the soil, are beautifully illustrated by the singular and interesting "fairy rings" met with in old pasture-land in England, of which Keith gives the following account: "In passing over heaths or other pastures, the observant traveller often meets with circular belts of herbage of a deeper shade of green than the general surface, encompassing several yards in diameter. In autumn, these belts are covered with a species of mushroom. In former times, it was reckoned very good philosophy to ascribe these rings to the traces left by the elves or fairies in their midnight revels, in which they were supposed to 'foot it' on the dewy green." But after the time came when man could see "no elves mo," it became necessary to look for a new explanation of the phenomenon. The following may be taken as the new and philosophical explanation: A sporule, or seed of a mushroom, falls on soil suited to its growth. There it soon fixes itself, and begins to send out, immediately below the surface of the soil, small threads, by gardeners termed "spawn," in the direction of horizontal rays, till they form a sort of network of fibres, resembling the skeleton of a leaf. The mushroom itself is merely the fruit. This fruit, which is produced towards the circumference of the rays, comes, of course, in the form of a circle; but, after a year, the same soil suits it no longer. Hence these thread-like fibres, or spawn, recede from the centre to the circumference in quest of fresh soil, and now appear as a circular belt round a central space. When this belt is also exhausted, it recedes still further from the centre, leaving a dark green belt behind it enriched by the decay of the mushrooms that grew on it. In this instance, the rotation goes on in an annual circle, just like the wavelets formed by dropping a stone into a mill-pond. Fortunately for man, the rotation of vegetable life forms one of the natural laws of creation, and is still in force. I have watched its progress for several years on land lying due west of the building in which we are now assembled, and stretching away from the Moonee Ponds Creek to the Saltwater River. Part of it is now occupied by Mr. J. T. Smith, M.L.A. Many of you, I have no doubt, have observed the same thing. After the land had been exhausted by successive crops of oaten hay, and left to nature, the first plant that took possession of it was this so-called "Cape weed." This plant came up as thick as if it had been sown for a crop; but in a couple of years it gave way to this one, sorrel, with which, I fancy, most of you are pretty well acquainted. The sorrel was naturally succeeded by white clover, the acid excretions of the sorrel being just the food suitable for the clover, and the ground is now occupied by poor non-nutritious grasses and weeds, owing to the exhaustive system having rendered it unable to support a higher order of more nutritious herbage. This land affords a fair sample of much that has been cultivated, and exhibits, in truth, a portion of "Victoria suffering a recovery." The cheapest method of restoring the fertility of such land would be to let it run to "bush" again; for the action of trees is threefold: first, by the shedding of their leaves, and, with us, their bark, they add to the accumulation of vegetable matter on the surface of the soil; second—and this is a most important part that trees play in the economy of vegetable life—they bring up, through the medium of their roots, from the lower strata, substances of vital importance to the growth of plants, but of which the surface may have been deficient; third, the shade and shelter afforded by trees prevent that rapid combustion or decay of the vegetable matter which takes place when it is exposed to the full glare of the sun's light, and the drying winds of our Australian summers. I think there can be no doubt but that the advent of civilised man, and his practices in these colonies, must tend to check or counteract the natural and progressive development of vegetable life, and the climatic conditions dependent on that development, because the atmosphere is naturally so much drier, as the surface on which it rests contains less of water, and the soil's capacity for absorbing and retaining moisture is in proportion to the amount of vegetable matter contained in it. "The time in which water evaporates from sand, clay, and peat, in the same circumstances, is as four, eleven, and seventeen." Therefore, with the herbage grazed off by stock, as in a season like the present, until the surface of the soil resembles a beaten highway, and where the vegetable matter is dissipated and destroyed by the plough, the natural tendency of the climate must be to increased dryness. An intelligent application of water on a large scale to the purpose of irrigating grass land, and a judicious rotation of crops in connection with our cultivation, would tend to compensate, in some measure, by increasing the amount of vegetable matter in the soil, and at the same time wonderfully augment the stock-carrying capabilities of our land. But irrigation implies a large outlay of capital, and rotation of crops involves more of toil, more of anxiety, and less of leisure than the simple ploughing, sowing, and reaping of the present system, although it is true that it would decrease our risk of loss and render profit surer. In addition to this, rotation of crops involves our social and moral improvement—things of no slight importance—for it implies constant employment to the working man; this leads to habits of steady industry, sobriety, and morality. The master is led to take an interest in his servant, and the servant in what pertains to his master's welfare, to the mutual benefit of both. Indeed, the rotation of crops, which means the adoption of a rational system of cultivation, affects not the farmer only—the whole community have an interest in it; and even the future of "our boys" will be very materially influenced by it. I will now conclude this lecture with one of Martin Tusser's "Five Hundred Points of Good Husbandry." He says quaintly enough, but truly, three hundred years ago, what aptly describes our present system :—

"Otes, rie, or else barlie, and wheat that is gray
Brings land out of comfort, and soone to decay,
One after another, no comfort betweene,
Is crop upon crop, as will quickly be seene;
Still crop upon crop many farmers do take,
And reape little profit for greediness sake."

The lecturer then procceded, by way of recapitulation, to exhibit a piece of basalt, as representing in part the mineral substances required by plants; and another piece, covered with lichens, showing the first process of the formation of soil. He then went on to explain the various gradations or rotations of vegetable life, up to the production of wheat, barley, &c. He had not, he said, brought samples of the bread and beef, but concluded by saying that—

"Clever chiels and sturdy hizzies
Are bred in sic a way as this is."

FRAMLINGHAM FARMERS' CLUB.

The monthly discussion meeting was held on Monday, January 28 ; the president, Mr. F. S. Corrance, in the chair.

The President said he had received a communication from the secretary of the Dorchester Farmers' Club, asking them to join with the Dorchester Club in passing a resolution in favour of the appointment by Government of a Minister of Agriculture. It was certainly a political question, but at the same time it was a purely practical question, and entirely independent of party politics, and therefore he saw no reason why the club might not take it into their consideration. The communication was as follows :—

"DORCHESTER FARMERS' CLUB.

"That in the opinion of this club it is desirable that Government be memorialized to appoint a Board of Agriculture, and that the secretary do communicate with the Central Farmers' Club, and other farmers' clubs, by printed circular, to ascertain their views on the subject, in order that united action may be taken if deemed advisable."

Dorchester, December 18, 1866.

Sir,—Above is a copy of the resolution passed at the last meeting of this club, which I have been directed to forward to you, and I shall be obliged by your bringing the subject before your club, and communicating to me their wishes thereon, at your earliest convenience.

I remain, yours faithfully,
G. J. Andrews, Hon. Sec.

He had written to the secretary of the club, saying he would place the resolution before the next meeting of this club. This was a subject of great and growing importance, because the matters connected with agriculture which required the attention of the Legislature were increasing, and becoming more pressing every day. At the time when the appointment of a Chancellor of the Duchy of Lancaster was in abeyance, he (Mr. Corrance) wrote to Mr. Milner Gibson, suggesting that the duties of a Minister of Agriculture should be added to those of the Chancellor of the Duchy of Lancaster. He thought Professor's Gamgee's lecture and M. Bahic's admirable report, setting forth the state of agriculture in France, had pointed the moral of the value that a Board of Agriculture would be in this country ; for they could not expect that agricultural affairs would receive the attention which they really required at the hands of Government except under some special ministerial supervision. In reply to his communication, Mr. Milner Gibson said he thought the subject was an important one, and he would lay the suggestion before the Government ; and the result was the appointment of Mr. Goschen, a City man, as Chancellor of the Duchy of Lancaster (laughter). However, he believed the question would be seriously considered before long, and it was for the members of this club to say whether they, as agriculturists, wished to have a distinct recognition by Government, such as they would have if a Minister of Agriculture were appointed. He would therefore take the opinion of the club whether they would notify to the Dorchester Farmers' Club that they coincided with the resolution which they had forwarded.

Mr. Barnes asked whether the question had been taken up by the Norfolk Chamber of Agriculture.

The President said he did not know whether it had as yet been considered by the Norfolk Chamber, but he was decidedly of opinion that the Chnmbers of Agriculture ought to take the question up, and no doubt they would do so. He found that the Bath and Wells Society, and a great many other influential agricultural associations had taken up the question, and he believed the agitation would be carried on with some spirit. He would propose that this Club adopt so much of the resolution which was passed by the Dorchester Farmers' Club as would express the opinion of this Club "that it is desirable to memoralize Government to appoint a Board of Agriculture."

Mr. Barnes seconded the motion, which was then put to the meeting and carried.

The subject for discussion at the meeting was "Agricultural Chemistry and its importance to the farmer."

Mr. Edward Packard, jun., of Ipswich, introduced the subject by reading a long and elaborate paper, in which he explained with scientific exactness the chemical and mechanical composition of the air, water, the soil, and growing plants, showing what conditions are necessary, under different circumstances, for successful agriculture. He said this was a very scientific subject, and it was its scientific character which had led to its selection, for we were entering upon a scientific age, when science or the results of scientific research were brought to bear on almost every branch of art, manufacture, and industry ; and the result in an economic point of view was, that mechanical labour was brought to a higher state of perfection and its results were obtained at a much smaller cost, and not only the consumer but the manufacturer himself was benefited. Chemistry was the science which more particularly concerned them as agriculturists, for without in any degree undervaluing geology, botany, mineralogy, &c., it might he said without question that chemistry had contributed more towards the improvement of agriculture than any other science. He would first of all explain the chemistry of the air, the soil, and water: the conditions on which the life of the plant as well as of the animal depended. Mr. Packard then explained the chemical constitution of the atmosphere, of water, and air, describing the nature of the simple elements which enter into their composition, and the difference between the chemical and the mechanical combination of those elements. Speaking of ammonia, one of the elements which exists, in a small proportion, in the atmosphere, he pointed out how in combination with nitrogen, under the form of nitrate of ammonia, it falls to the earth through the medium of rain, and assists greatly in refreshing the crops, and stated that, besides ammonia, nitrogen, oxygen, and carbonic acid gas were generally found in rain and snow water, and contributed to the fertilization of the soil. He also pointed out the manner in which oxygen, carbon, and other constituent elements assist in the growth and constitution of the plant. He called particular attention in his description of the composition of the soil to *humus*, which he said was a most valuable constituent of all cultivated soils. Humus was the vegetable matter, such as the roots, leaves, and other parts of plants not carried off the land with the crops. It was present in a partly or entirely decomposed state. The dark colour of many soils was due to the abundance of humus. The dark colour of the light heath lands of Suffolk, for instance, was due almost entirely to the large amount of organic matter which they contained. Humus had the power of absorbing a large proportion of ammonia from the atmosphere and transmitting it to the plant, and at the same time it gave off carbonic acid, which was absorbed into the plant through the medium of its roots. With regard to irrigation he said any description of water was fitted for it, but to enable the land to benefit from its application it was necessary that the drainage should be good. In describing the constitution of the soil, he divided it into two parts, mineral and organic. He explained, at considerable length, the chemical and mechanical causes which have contributed to the disintegration of mountain and rocky substances forming the mineral portion of the soil. The principal elementary substances of which the mineral part of the soil is composed, were silica, lime, alumina, oxides of iron, phosphorus, magnesia, potash, soda, sulphur, chlorine, and fluorine; and the fertility of the soil depended on its containing more or less abundantly all those substances. Phosphorus was present in the soil as phosphoric acid, and it was a most important item in the formation of plants. But it was not distributed in the soil with any apparent regularity, and when the proportion was deficient, the deficiency should be made up by the application of artificial phosphoric manures. Silica, or sand, was the largest ingredient in all soils, and bore an important part in the formation of plants, especially in the grain-crops. Lime was present in all soils—at least, in all that were under cultivation—and was indispensable in the growth of plants. The organic elements of the soil consisted of humus (already described), of undecayed parts of plants, roots, &c., and of various animal matters. Different kinds of land were commonly divided into vegetable mould, clayey soil, sandy soil, calcareous soil, and marshy and loamy soils; and these soils differed from each other, from the fact of their containing a greater or less quantity of the constituent elements which he had described. Vegetable moulds contained a large proportion of vegetable matter. Clay soils were rich in mineral properties, and were, therefore, capable of producing large crops of grain. This soil possessed the property of absorption to a great extent; and therefore the manure which was applied to it was retained in the soil, and did not work through into the subsoil. After explaining at some length the manner in which different kinds of soil would absorb and retain ammonia, he said sandy soils contained from 60 to 70 per cent., and possessed but little power of absorption, and therefore manure should be applied to it in small quantities at a time. In calcareous soils carbonate of lime predominated. They were easily worked, and were adapted for leguminous crops. Marly soils were a mixture of clay and lime; and loamy soils were a combination of all the others. As a rule, they were the most fertile of all soils, after the vegetable moulds, and contained a fair proportion of all the required constituents. Vegetable moulds required burning and the application of lime, in order to reduce the organic part to a more desirable proportion in relation to the mineral part of the soil. Clay soils were not so easily improved, and the improvement was expensive. Drainage was indispensable to this description of soil; and burning and the addition of the deficient substances, such as lime, were very beneficial. Mr. Packard next explained at some length the formation and composition of plants. The organic part of the plant, consisting of vegetable fibre, colouring matter, vegetable albumen, starch, water, &c., were compound substances, not present in the same form in the soil, water, or air: they were the result of vegetable life, and could only be produced when the ultimate elements were supplied to them. But the organic food of plants was not of more consequence than the mineral: both were alike indispensable. Of the fifty-four elements, those which were at present known to enter into the composition of plants were carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, alumina, magnesia, lime, silica, chlorine, soda, potash, and iodine. After showing how the plant is improved by the cultivation of the soil, he said, in order to know what mineral food is required by plants, it was necessary to determine first what the ultimate constituents of the plants are; and if the soil did not contain those elements in sufficient quantities, it was necessary then to determine what manure it was best to supply, and in what proportions. He referred to ammonia as a stimulant to the growth of plants, rendering certain elements in the soil available for the plant, and pointed out the consequent benefit to be derived from the application of ammoniacal manures; but care, he said, should be taken not to apply too much ammonia without a proportionate amount of mineral food, or the soil would become impoverished by the loss of mineral matters set free by the ammonia. Speaking of farm-yard manure he said much had been said about the great waste resulting from the escape of ammonia from the manure heaps; but there was really no escape of ammonia from manure when left to rot of its own accord. It was true that ammonia was liberated in the heap; but it did not escape into the atmosphere, but was fixed and combined with other substances. The real loss in manure heaps was owing to the drainage, from which great loss was sustained when the heaps were exposed to the action of the weather. Turning over manure heaps, which are in a state of active fermentation, should be avoided as much as possible, as it is then that a loss of valuable volatile substances occurs; but when active fermentation has ceased, then no loss would result from this cause. When manure is properly rotted it should be used at once, as certain subsequent chemical changes take place which deteriorate its value as manure. On clay soil the manure might be spread over the land for a time before ploughing, but on other soils it was best ploughed in as soon as spread, as by that course might be secured the vegetable matter which by fermentation is driven off in the form of carbonic acid gas. Exposure to weather was very objectionable; for it had been proved by analysis that manure made in open yards bore no comparison with that made in covered places. After twelve months' exposure manure lost two-thirds of its manurial constituents, whilst when it was protected by sheds little or no loss occurred. Farm-yard manure was the most valuable, the most perfect and most complete manure, for no other contained all the materials removed by cultivation; but unfortunately it was utterly impossible to produce a sufficient quantity of farm-yard manure to supply the loss of those substances carried off by the plant, and, therefore, artificial manures became indispensable. In speaking of the advantage of the rotation of crops, Mr. Packard said that clover was a plant sending a great many roots into the soil, and those roots were formed of much valuable matter, almost entirely derived from the atmosphere, and being left in the soil they gradually decomposed and formed the valuable substance humus, and that only at the expense of a small proportion of mineral matter taken from the soil; and, therefore, a crop of clover was better for the land than a fallow, and that was the case to some extent with some other crops. Sainfoin was an excellent fodder crop to grow on a thin exhausted soil, for it had the peculiar property of sending its roots into the subsoil, and of thus extracting from the underlying soil quantities of mineral substances, and as those roots remained in the soil after the cutting of the crop, decomposition took place, and the mineral matters from the subsoil were rendered available for other crops. In the process of rearing and fattening cattle which are sold off the farm, large quantities of mineral and organic matters were taken away, and these could only be restored to the soil by the use of oilcake and other artificial food in feeding, and by artificial manures. In conclusion, he said he thought they would not question the assertion that the practical farmer ought to know the composition of the crops he cultivated, and of the soil by means of which they are grown, as well as the composition of the manure which he employs. At present the science of agricultural chemistry was far from perfect, but by the co-operation of scientific and practical men results would be eventually obtained, which would render farming more profitable, and better enable the farmers to compete with the continent, thus permanently benefiting the agricultural community, and adding to the wealth of the country.

The President said he was afraid very few of them would be able to follow Mr. Packard into a discussion of the more scientific part of his lecture, but he would call upon the members to ask Mr. Packard any questions having a practical relation to farming which might have occurred to them. He believed Mr. Barnes, of Kettleburgh, had recently used some artificial manure with good results, and he would ask him to give the club the benefit of his experience.

Mr. Barnes said he had used nitrate of soda with good results.

The President: At what time did you put it on?

Mr. Barnes said he applied it when the plants began to start. The result was very satisfactory in its application to wheat, but not to any other crop. He believed it gave an increase of from five to six bushels per acre.

Mr. Goodwyn was surprised that heath-land should be so barren if, as Mr. Packard said, it contained so much humus, which was so important an element to vegetation.

Mr. Packard said the vegetable matter in heath-land was not sufficiently decomposed; but his remarks as to the excess of humus referred rather to peaty and boggy land than to heath. Such land was not fertile, in consequence of the absence of the necessary mineral matters.

The President said Mr. Packard had spoken of the dark colour of the earth as an indication of the prevalence of humus; but it must be remembered that a dark colour was often produced by the presence of iron, especially in sand.

Mr. Goodwyn Goodwyn said black sand was the most unproductive of any soil.

Mr. Packard said that a dark appearance in the soil was certainly caused, in many cases, by the presence of iron.

Mr. Goodwyn asked how it was that soils that had deteriorated by the repetition of crops without manure could be rendered fertile by burning and lime.

Mr. Packard said they could be restored to fertility by burning and by artificial and other manure, which restored the ingredients which had been drawn from the soil by the crops.

The President said it appeared to him that burning would destroy the humus, which was so necessary for the plants.

Mr. Packard said it was only where there was a superabundance of vegetable matter in the soil that burning would be beneficial.

Mr. GOODWYN asked why manure might be longer exposed to the air on clayey soil than on other descriptions of land?

Mr. PACKARD said, because the clayey soil would aborb the mineral ingredients that might be washed through out of the manure by rain, and so benefit by it, while sandy soil would let those ingredients pass through till they were too deep to benefit the crop.

Mr. R. CAPON asked whether frost would not be very injurious to manure?

Mr. PACKARD said his opinion, when he read a paper before this club last year, was that frost would not injure the manures, and he was still convinced that it would not, in the slightest degree, affect phosphatic manures, but with regard to the question whether it would injure guano, they had been carrying on some experiments, with the assistance of the consulting chemist of his firm, and he hoped to be able, upon some future occasion, to lay before that Club the results of those experiments with regard to the action of the frost upon guano.

Mr. CRACKNELL asked if the waste lime from the gas-house would be beneficial upon the land?

Mr. PACKARD said it might be beneficial in some cases if used with care and discretion; but as it contained prussic-acid in rather large proportions, it was a rather dangerous application.

Mr. CRACKNELL said he had used some, and he thought it had been rather beneficial to the wheat crop.

Mr. PACKARD said it ought not to be applied in a fresh state.

The Rev. C. CORRANCE said he thought an inquiry into the chemical processes concerned in agriculture would lead them to appreciate the importance of early ploughing, and would also teach them that it was bad economy to allow their muck-heaps to lie exposed to the air, and to allow the liquid manure to run away from the heap.

Mr. GOODWYN asked a question as to the best method of improving pastures, and also of turning arable land into pastures.

The PRESIDENT said he thought the best answer to that question would be found in a recent article in the *Journal of the Royal Agricultural Society*, extracts from which he read.

After some further conversation,

The PRESIDENT proposed a vote of thanks to Mr. Packard for his able and excellent lecture, expressing his regret that the inclemency of the weather had prevented many members from attending.

Mr. PACKARD briefly acknowledged the compliment.

The PRESIDENT said, as a vacancy would occur in their list of discussions in the month of May, he would, with the consent of the Club, fill the vacant place by reading a paper on "Our present Poor Law System." He was utterly and entirely dissatisfied with our present system of affording relief to the poor. Our poor laws were, he thought, a relict of a time now gone by, and required entire re-consideration.

THE MALT-TAX AND THE GAME LAWS.

A meeting was held in the Corn Exchange, at Beccles, on Friday, January 25, immediately upon the conclusion of the business of the market, to hear addresses from Mr. R. Jasper More, M.P. for South Shropshire, and Mr. C. Sewell Read, M.P. for East Norfolk, on the Malt-tax and the Game Laws, a meeting having been convened of the farmers of that locality, "with the view of eliciting the opinions of such gentlemen as take an interest in those important subjects." The chair was taken by the mayor, Mr. W. W. Garnham, and there was a very large attendance, the Corn Exchange being quite crowded.

Mr. R. JASPER MORE said he felt that a word or two were necessary to explain why he was there upon that occasion. He was very nearly being in Suffolk some time ago; a gentleman who had once represented one of the boroughs of this county invited him to meet some of the agriculturists, but he was unable to do so at that time, and as he now had the pleasure of staying with a gentleman in the county, and had been solicited to present certain petitions from this county, and as he had been asked to attend three markets, he had accepted the invitation to attend Beccles market, and from the manner in which they had gathered together upon that occasion he was led to feel that the kindness and cordiality of Suffolk men were as exuberant as their crops. His position and that of Mr. Clare Sewell Read in regard to agriculture were very different. Mr. Read was a professor of the science, and a prince among farmers; while he (Mr. More) was a mere student, the farmers' humble servant. He wished also to disabuse their minds of the idea that, because he happened to unseat the gentleman who carried through the House of Commons the last Game Bill, therefore he presumed to be an authority on the Game Laws; they would perhaps be surprised to hear that, in his canvas in South Shropshire, he never made one single speech on the subject of the Game Laws; for public opinion needed no stimulus on that subject. He had, however, the honour of seconding the motion upon the Malt-tax proposed by the late member of East Suffolk, Sir F. Kelly. He presented himself to the electors of South Shropshire as he stood forward now, to assert a principle dearer to his heart than either the repeal of the Malt-tax or the Game Laws; it was the question of freedom of election in counties; he came forward to give the tenant farmers an opportunity of giving free expression to their opinions in a county in which the farmers had never had an opportunity of having their opinions represented in Parliament since the Reform Act of 1832, there never having been a contested election in the division of South Shropshire during that time. He remembered reading the speeches of those gentlemen who brought Mr. Clare Sewell Read forward for East Norfolk, and those speeches had the good old English ring about them. He had seen something of that kind of thing in Shropshire, and the election of his friend Mr. Read and himself was a standing proof that a direct appeal to the tenant farmers and the independent men in counties was like a stone from the sling of a young David, which would pierce the panoply of monopoly of reqresentation, whether in the hands of Whig or Tory landlords. He could not address them on the subject of the Malt-tax without speaking of the great debt of obligation which they all owed to Sir Fitzroy Kelly for the manner in which he devoted his great talents to the question. Sir Fitzroy Kelly brought that question forward with great perseverence in the House of Commons, when the great leaders of his party, even Mr. Disraeli and Lord Stanley, went out of the House and did not support him. The question of the Malt-tax was divisible into two parts. There were, first of all, those arguments for the repeal of tax which, he had no doubt, had been brought forward in this county, as they had been in Shropshire, by the tenant farmers, and which were really unanswerable; and, secondly, a few considerations which outweighed all those arguments when the question came to be considered in the House of Commons. The first question for them to consider was how it came to pass that the Malt-tax remained now just in the same position as that in which it stood when the repeal was carried in 1835. It was usual for a member to try to speak like a muffled bell, and if he succeeded in mystifying his hearers sufficiently as to leave on their minds a most confused idea of what his opinions were, experienced politicians considered him a very clever fellow. But he would tell them what he really thought, even at the risk of giving offence. He would assert that the reason why the Malt-tax repeal had made so little way in the House of Commons was that the county constituencies had not, during that period, been properly represented. It was both vulgar and absurd, of course, to say that a man could not be a good member of Parliament because he was a lord. And in the cases of men like Lord Cranborne and Lord Stanley, who entered the House after a high University education, the devotion of their time to the interests of the country only increased their nobility. But in reviewing the history of county representation for that time it is impossible to deny that many men were sent to Parliament merely to increase the local interest of some great relation, or his interest with the Minister of the day, or they were sent by their relations to the House of Commons because not having received a University education it was considered that the House might afford an easy way for their obtaining a little information before they became peers. The consequence of that system of representation had not been to advance the agricultural interest. At the time when those men represented counties, what were the manufacturing constituencies doing? They were sending up the cleverest men they could find, who took every opportunity of meeting their constituencies and of learning their views, and at Chambers of Commerce those views were brought into shape, and introduced into the House of Commons, and when those men were pitted against members for the counties such as he had described, who could be surprised that the interests of the counties went to the wall? In 1846, when the Corn Laws were repealed, everyone declared that the Malt-tax must be repealed also, and why did not the county members insist that it should be done? In 1852, when Mr. Disraeli proposed the reduction by half the tax, why did they not support him? Was it because the county members took such a comprehensive view of taxation that they thought no excise duty ought to be removed unless the whole were taken off? or was it because they did not like the substitution of the house tax? or was it because they were not aware that the farmers took so much interest in the question? Why was it that at the present moment the question did not receive the full weight of the support of the Country party in the House of Commons? It was sometimes said that it was because the landed interest was not sufficiently represented there; but he denied that, because it was shown in the debates upon the Cattle Plague Bill that when the representatives of the landed interest pulled together boroughs were nowhere. The *Spectator* said at that time, that if the farmers had pulled together for the repeal of the malt-tax as they did for the Cattle Plague Compensation Bill, they would have repealed the malt-tax, and put the duty on cotton. The reason for this was, that there were two distinct interests, the landed and the agricultural—the landed interests was well represented, and the agricultural was not. The agricultural interest would not be properly represented until men of the character and talents of his friend (though probably they would not have the talent of his friend Mr. Read) were returned (applause). The lauded and the agricultural interests were identical, it was true, in some respects, but not in all, and the landed interests had not cared to forward the repeal of the malt-tax ever since Sir Robert Peel told them that the result of the repeal of the malt-tax would be an increased income-tax: they did not support the repeal of the malt-tax because they were afraid of direct taxation. Then what did Mr. Cobden tell them? Mr. Cobden told them that the malt-tax would never be repealed by the imposition of a substitute for that tax; the House would not allow of any substitute, and the malt-tax could only be repealed by the agriculturists helping men like him to go in for a reduction of taxation. It had been stated that Lord Stanley had said that the Government of this country could be carried on just as well if the taxation were reduced by 10 millions; and if that were so the reduction of only 6 millions would enable the Government to repeal the malt-tax. He would be sorry to say anything against Mr. Bright, because whatever might be said in the way of attack only tended to increase the influence of men like Mr. Bright; but there was this difference between Mr. Bright and Mr. Cobden, that Mr. Bright talked of reducing the expenditure without saying how it was to be reduced, whilst Mr. Cobden showed the way in which it might be reduced; and if they could get any financial reformer who would bring forward a scheme before the House of Commons for reducing the expenditure, and if they could help him to carry such a measure, they might get the repeal of the malt-tax; but that was the only way they had of doing it. He would say just one word on the subject of the game laws. The common law of England gave the occupier of the land, who might be the landlord, but in nine cases out of ten was the tenant, the complete possession of the game on his land, but the result of the progress of society was the increase of the fashion by which the tenant surrendered his right to the landlord; and if the farmer took his land upon this agreement, the Legislature could not contend against the terms of those agreements. It was a completely private arrangement between the tenant and landlord. It was sometimes said that there was no grievance in the game laws, because the farmer perfectly well understood that a certain amount of game would be preserved when he took his farm; but the tenant oftentimes found that there was three times as much game as he expected to find, and it was impossible to give him adequate compensation for the amount of injury which his crop suffered. There might also be two or three different proprietors, and it was impossible to estimate the damage that was done by the game in each case. In going about in different counties he found public opinion had influenced the landlords to the extent of putting down a good deal of excessive preservation of game, especially of ground game, and in some cases the landlords gave the farmers the right of shooting after a certain date, and occasionally at other times. No doubt the cultivation of good feeling between landlord and tenant had influenced the landlords in such matters as those in a manner which could not be accomplished by the Legislature. In conclusion Mr. More strongly advocated the establishment of Chambers of Agriculture, as a means of furthering the political interests of agriculturists. There were now twenty-seven of these Chambers either formed or in course of formation, all associated with a Central Chamber in London, and no doubt by-and-bye they would become sufficiently powerful to assist them materially in obtaining their rights in the repeal of the malt-tax, and in any question which occupied the agricultural mind.

Mr. Clare Sewell Read said there was one fact to which he wished to draw their attention in connexion with the question of the malt-tax movement, particularly in this remarkable season, and that was the extraordinary quantity of sugar that was now being used in the manufacture of beer in consequence of the high price of barley. Many people said the wind was taken out of the sails of the advocates of the repeal of the malt-tax by the present high price of barley, and that the farmers now did not care to agitate for the repeal of the malt-tax; but he would tell them that if there were no malt-tax they would have a still higher price for barley than they had at present, for then sugar and other articles would never be brought into competition with them in the manufacture of beer. He had been informed, on high authority, that there was one very large brewer now using 50 per cent. of sugar, and he was also told, on equally high authority, that contract was entered into in the early part of last month for the supply of 100 tons of sugar per week to one single brewer in London. Now, he supposed that sugar cost 32s. per cwt., and the excise duty was only 3s. 4d. per cwt., and the revenue officers, who were monstrously particular in their supervision in regard to the malt-tax, were exceedingly lax in their supervision in respect of the sugar duty. After quoting evidence in proof of this statement, Mr. Read said what they wanted was to make malt so cheap that it would not answer the purpose of the brewers to use anything as a substitute. It was said that now that the friends of the farmer were in power they might expect to be relieved from this oppressive tax. Well, but Mr. Disraeli did try to give them some relief by a reduction of the malt-tax, as he had recently told them, and the consequence was that he was turned out of office. In the meantime the burden of the malt-tax had restricted the consumption, for 30 years ago it realized 4 millions, and now it was only 6 millions, and the consequence of Mr. Gladstone's policy had been to increase largely the consumption of spirits at the expense of the consumption of beer, to the injury of the consumers, and to the great detriment of the interests of the farmer. It was a very simple resolution which was proposed by Sir Fitzroy Kelly last year—that future surpluses should be reserved for the reduction of the malt-tax; but Mr. Gladstone, who had previously reduced the duty on tea as a final settlement of the question, further reduced that duty to 6d., rather than reduce the duty upon malt. Under these circumstances the present Ministry could not be expected to repeal the malt-tax at once and impose a property-tax; all that could be asked of them was to give up the surplus, or a portion of it, towards the reduction of the duty; and it was his opinion that if they shifted the duty and put it on the manufactured article, beer, they would make the malt so cheap that it would be the most economical article the brewers could use (Hear, hear). A brewer's licence of 3d. per barrel produced £360,000, and therefore a brewer's licence of 3s. per barrel would produce £4,300,000, and surely that would be tax enough to put upon the poor man's beer. In regard to the game-laws, Mr. Read said he was quite sure the farmers did not object to winged game; what they objected to was the over-preservation of running game. Any man who occupied a farm and objected to any manly country sport on the part of his landlord, was unworthy the name of a British farmer. He did not believe they could have too many partridges, but when they came to hares and rabbits it was impossible to farm against them. Everybody boasted of something or other, and it had of late been the boast of many landed gentleman that an enormous number of head of game were killed in a single day's sport. He had recently had a letter from a gentleman's estate, showing that in four days 3,100 hares and rabbits were killed ("Shame"). He believed the owner of that estate was a thoroughly good landlord, who tried to make his tenants comfortable; but how was it possible to do so when such a large quantity of game ran over their land, however cheap the rent might be? 3,000 hares and rabbits! It was said that three hares ate and destroyed as much as a sheep, and four or five rabbits did the same; and if that were so, those hares and rabbits would do as much harm to the land as 500 sheep, with the additional disadvantage that they were not kept in fold, but went all over the farm. No doubt it was to a great extent a matter between landlord and tenant, but he believed there would be a Bill introduced into Parliament this session, by Mr. Maclagan, member for Linlithgowshire, who represented the farmers there as he (Mr. Read) represented the farmers of East Norfolk. The first clause of that Bill would drop hares and rabbits from the Game List; the second would remove prosecutions under the Game Laws to the jurisdiction of the Sheriff (an officer in Scotland in a somewhat similar capacity to our County Court Judge), the object being to remove prosecutions under the Game Laws out of the hands of the Magistrates; the third clause would have the effect of removing the cumulative penalties for offences against the Game Laws; and the 4th clause would provide that damages caused by game should be valued by the Sheriff. Perhaps that Bill would go further even than the British farmer wished to go, but it was only intended to apply to Scotland. The striking of hares and rabbits out of the game list, however, he believed would be better for the landlord, better for the tenant, and better for the community at large.

Mr. More said he should be opposed to the making of any exceptional law for Scotland; he thought that whatever change took place in the Game Laws should be made to apply to England, Scotland, and Ireland.

Mr. R. Haward complimented his brother-farmers on the presence among them of two members of the House of Commons, who were carried into Parliament on the shoulders of the farmers in spite of all the influence that the landlords could bring to bear against them. Notwithstanding all that had been said about the malt-tax, it was a worse grievance now than it was 30 years ago, while the taxes upon almost every other article of consumption had been reduced or repealed. The game laws were first introduced into the country at the time of the Conquest in the shape of forest laws, and for the last hundred years instead of getting better they had been getting worse for the farmer and more oppressive to the lower classes. After speaking against the cumulative penalties for repeated offences against the game laws, which he said were much more severe than the penalties for stealing poultry, he denounced in strong terms the Act of 1862, under which the police are employed to watch the game, saying it was hard upon the ratepayers to pay the police to perform those duties, and especially hard upon tenant-farmers who had under that Act to keep the game and to pay the gamekeepers. In his opinion not only ought the game preservers to pay for the protection of their game, but they ought to pay all the expenses of prosecutions under the Game Laws. That Act of 1862 was brought in by Lord Berners and seconded by Sir B. Leighton the then member for South Shropshire, and it was to the honour of the Shropshire farmers that they had at the very next election returned Mr. More, as the electors of East Norfolk had returned Mr. Read. When that Bill was passed where were the Suffolk members? Why, three out of four of them voted in favour of it, and it was smuggled through the House at the fag end of the Session at four o'clock in the morning. The consequence of that Act, as they all knew in this game-preserving country, was that game was more preserved now than ever; the farmers had no remedy, and the consequence was that many of them were ruined. He would take the jurisdiction in the case of offences under the game laws out of the hands of the magistrates. The remedy was to send such men to Parliament as Mr. More and Mr. Read, who would take care of the farmers' interests while they took care of their own.

Mr. H. A. Grimmer, of Norfolk, said he had recently examined returns of the crops throughout the country, and it appeared that the quantity of barley grown in the county of Norfolk was equal to one-tenth of that grown in the whole kingdom; Lancashire stood next, and Suffolk next; but Suffolk had a larger proportion of barley than Lancashire for its acreage. Norfolk and Suffolk might be said to be the largest producers of barley in the kingdom; and the two counties together, taking their produce at only six coombs per acre, paid about one-fifth of the malt-tax, which was about one million of money, or a tax equal to about 10s. per acre upon the land of Norfolk and Suffolk. He thought such facts ought to open their eyes; and he regretted that as farmers they were not more united upon that question. He was not one of those who argued that the farmers were going to be greatly benefited by the repeal of the malt-tax; but it was an iniquitous thing that the beverage of the industrious classes should be so heavily taxed. When they went to the Ministers they got the cold shoulder; but that would be changed if the farmers were more united, and returned such representatives as Mr. More and Mr. Read. He advocated the establishment of chambers of agriculture, and said that at the Norwich Chamber of Agriculture the next day, Lord Suffield, a great game preserver but an excellent landlord, would bring forward the question of rating of game and woods; and he (Mr. Grimmer) also contended that game and woods ought to be rated.

Mr. E. Deck spoke in favour of the repeal of the malt-tax, and said he agreed with what Mr. Read and Mr. More had said with regard to the game-laws being a matter between landlord and tenant. For his own part he would never hire a game farm; and if farmers would look to their own interests and make their own bargains, it would go far to settle the question of hares and rabbits. He was in favour of preserving English country sports, but he thought those sports might be enjoyed without that wholesale slaughter of game that took place in the present day whenever those grand *battues* took place, which tended to place His Royal Highness the Prince of Wales, and the noble company whose visits they were glad to hear of in this county, in the light of mere slaughterers before the country instead of English sportsmen. He loved good sport, but when game was flying round their heads like fowls in a farmyard it was not worthy the name of sport. He did not want to deprive the landlord of his sport, but let there be the principle of "Live and let live."

LAND AGENCY—ITS NATURE AND DUTIES.

The following paper was read by Mr. C. C. Grey at the Annual Dinner of the Hexham Farmers' Club:

In former times money rents were received by the stewards of manors, who were generally lawyers, having to look after the manorial rights of the lord. Some rents were paid in kind, or by service at the manor-house, or in following the lord to the wars. The altered position of landlords and tenants in modern times rendered it necessary for landowners, who, being occupied in politics, war, pleasure, or other pursuits, had not time to attend to the business of their estates, to appoint substitutes to receive their rents and look after their interests; and more recently the increased importance of improvements on estates, consequent on the progress of agriculture, has led to the appointment, as land agents, of persons specially trained for the duty; in fact, land agency has become a regular profession, and the sooner all landowners acknowledge this fact and adopt it, the better will it be for themselves and the country. A land-agent has to look after all the interests and exercise much of the power of the landowner, and he should be a connecting link between him and the tenants. It is, therefore, of great importance to the well-being of tenant-farmers and others that he should be a man suited to the post, and capable of exercising a beneficial influence in the country. Land-agency may be considered first with regard to the position of the landowner, and second with regard to the position of the agent. With regard to the owner, the agency may be that of an estate on which, 1st, the owner never resides, being an absentee, a minor, trustees, a corporation or public body; 2nd, the owner may visit his estates or occasionally reside on them; and 3rd, he may be a resident. In the first case, the agent may be allowed great freedom of action, merely reporting his management to the owner or his auditor, and sending statements of his cash transactions, or he may be required to consult the owner or auditor, and obtain his authority before acting. In this case, if he has not the entire confidence of the auditor, or the auditor thinks himself qualified to interfere with the management, the agent is much impeded in carrying out his plans. In the second case, where the owner visits his estates, the agent points out and explains to him all that is going on, hears the owner's views and takes his orders, and is thus able to carry out those views from time to time. In the third case, where the owner is resident, the agent can have access to him on all occasions, and must carry out his views, himself advising when he sees occasion. But as we must take landowners as we find them, let us consider land agency with regard to the position of the agent. He may be, 1st, a resident agent on one estate, devoting all or most of his time to managing that estate, constantly visiting the different parts of it; 2nd, an agent over several estates, but all within reach, and which he frequently visits; or, 3rd, an absentee agent, who does the work of the estate through under-agents or bailiffs, and seldom or never visits it. This last kind of agency is unqualifiedly bad, and I shall not discuss it. The first is the best on large estates, but the second is good on small estates; for it is better for several small estates near together to be managed by one good agent than for each to be managed by a resident agent of such a class as can be found for the salary such an estate can afford. Even if the owner is resident, his estate may be better managed under the second kind of agency, unless he is fully qualified himself to do the business of his estate, with the assistance of a clerk or bailiff. I shall now point out some of the duties of a land agent, and when I use the word owner, it will be understood to mean also the auditor or person with whom the agent corresponds in place of the owner, or the board, or secretary of trustees, or public bodies who are owners. A very important duty, and one which many people seem to think is almost the only duty, of a land agent, is to receive and account for the rents of an estate. It is important, because it should be done correctly, and accounts promptly and carefully sent to the owner; otherwise it is one of the least and easiest duties of an agent on a well managed estate. A duty involving much greater responsibility, thought, judgment, and anxiety, is the letting of farms. It may be easy enough to advertise a farm to let, and accept the highest offer; but even if a farm is advertized, care and judgment should be exercised in seeing that the highest bidder is a man of capital, skill, and good character, and in framing proper conditions for his observance; but an agent should not resort to this mode of letting a farm when he can avoid it. If he has a good tenant, whose farm is running out of lease, he should be able to form a correct opinion of the value of such farm, and try to let it to the same tenant again; but if he cannot agree with him, then to some other farmer whose character is known. The agent, being thoroughly conversant with the systems of farming best suited to different localities, soils, and climates, and with the law of landlord and tenant, should frame the covenants for a lease or agreement, so as to leave as much freedom of action as possible to a good tenant, while they restrain a bad tenant from injuring the farm. If such leases have to go through the hands of an attorney, all he should do is to see that the language is sufficiently legal to make it binding, without rendering it unintelligible to an ordinary farmer. The farms being let, the agent should visit them occasionally, not only to see that the tenants are observing their covenants, but to make himself acquainted with their mode of farming, their personal qualifications with regard to industry, judgment in tillage and stock, and, if desirable, to advise them, or inform them of improvements that may be introduced in other places. The agent has to decide where new or additional buildings are most needed, and advise the owner which applications for such to comply with, and which to refuse. He has then to arrange and plan those that are to be made, so as to be most useful to the occupation of the farm, keeping carefully in view the future prospects of the farm, as much as the present requirements of the tenant; for the latter are sometimes fancies, and sometimes peculiarities of the man, or his mode of farming. It is not enough that the tenant should say, "I am willing to pay five per cent. on the cost." The agent must satisfy himself that the ultimate benefit to the estate will represent that interest or more. This applies to many improvements besides buildings. The agent should lay out the draining, or at least he must decide what land is to be drained, and the manner of draining it, and have a competent drainer to lay out the drains, himself visiting the work during its progress, so as to see that the outlets are good, that the drains are properly laid down, and that the work is being properly executed. The agent should himself decide on all alterations to fields, by new fences or otherwise, considering the quality of the land for growing turnips, corn, or grass, and with regard to water, shelter, and access; and, when farms are out of lease, or opportunities offer, making such alteration of boundaries as will improve the occupation of the farms and facilitate the keeping of good fences. In like manner with regard to new roads, reclamation of land, enclosing commons, and all manner of improvements of which landed property is capable; the carrying out of them with due regard to the means at his disposal and to economical execution should be his constant care; laying out general schemes of improvement probably years before he has the chance of realizing them, so that every improvement may be part of a comprehensive plan, and not an isolated act. He should also see that repairs are made where needed, whether such should be done by the landlord or the tenant. The agent must also himself transact all the business of letting mines, collieries, quarries, &c., though he may with advantage call in the aid of a professional mine-agent to report on workings, and advise him as to terms and conditions. He should also, as far as possible, judge for himself of the state of these works, so as not to be entirely dependent on reports. The agent should know the condition of all the woodlands, and himself decide what is to be thinned or cut away and replanted, considering whether the wood is for ornament, profit, or for shelter. He should also take a general interest in all matters, local or public, that concern the welfare of the tenants. He should see that no encroachments are made on the rights or property of the owner. He must keep correct cash accounts, and have proper vouchers for all payments, also a record of all letters written and received, with minutes of all verbal transactions, so that nothing may be trusted to memory, or to hearsay in case of his removal; also a record of all maps, deeds, leases, and agreements, contracts, and the like, whether they are in his office or have been sent by him to others; and all this information should be easily accessible to his employer or successor by means of indices to the subjects. The agent's knowledge of the value of land and its capabilities of improvement will enable him to advise his employer in the purchase and sale of land, which may be desirable for the interests or improvement of his estates. The duties of a land agent being so varied, you will naturally expect that the qualifications for performing those duties should be many, and that a man cannot be expected to possess those qualifications without a special training. The basis of this training is undoubtedly a good general education, and a practical knowledge of agriculture. It may be a question which part of such education should come first. A boy who is brought up on a farm, returning to it from school, has a considerable advantage over boys in other classes of society when he goes to an agricultural college, for with him the learning is not all theoretical. Though he may have done nothing but play at home, he knows the meaning of agricultural terms and the names of objects. A practical knowledge of farming being an absolute necessity for a land-agent in any case, he should go from school to work for a year or two on a good farm before he goes to the agricultural college. At school the best foundation for all education is a considerable knowledge of classics; it gives a facility for acquiring learning, a refinement of mind, and an aptitude for correct speaking and writing, which is most useful in after-life to a man who is to be brought much in contact with others. A knowledge of mathematics is also necessary in training the mind to reason soundly—to distinguish between cause and effect—and to arrive at proper conclusions from evidence, as well as to attain that knowledge of mechanical principles and aptitude for understanding machinery, which a land-agent should possess. Having been thus grounded at school, the intended land-agent should make himself master of the everyday work of the farm, and then go to an agricultural college, where he can apply himself to acquiring the more special knowledge required for his calling. There he must study chemistry, mineralogy, geology, botany, natural history, surveying, planning, measuring, and calculating work, book-keeping, and as much of law as may be applicable to his profession. Without some acquaintance with all these subjects he will find himself at some time or other entirely dependent on a subordinate for guidance. From college, he should go at once to the office of a good land-agent, where he can learn the duties of the office, and at the same time be able to watch the operations of farming, and gain practical experience in valuing lands. This he must do as a pupil, assistant, or under-agent, as circumstances permit. Having spent two or three years in this way, if he is steady and intelligent, he should be qualified to undertake an ordinary agency. Supposing the agent to have acquired the necessary knowledge, he should also have other qualifications. He should exercise a calm judgment, never coming to hasty decisions. He must be strictly impartial, and upright, as well as courteous in manner to all. He will thus gain the esteem of the tenants and the confidence of his employer, and be able to do good to both. He would do well to have applications made to him, in writing—though he may fully discuss the subjects orally—and ultimately give his answer in writing with reasons for his decision. This not only prevents disputes, but makes known the principles which guide his conduct. He should listen patiently to applications and reasons in support of them: something may often be gained, and nothing is lost by civility and attention. He should treat every tenant and workman as an honest and truthful man till he knows that he is not one. Nothing destroys an agent's influence or a landlord's popularity more than treating every application from tenants as if it were an attempt to over-reach the agent and impose upon the landlord. In dealing with his employer, the agent should always be respectful, but firm when he is sure his opinion is right, though he should be very careful that he has arrived at a wise opinion before he urges it. especially if it should be contrary to that of his employer. If he is obliged to yield his opinion to the wishes of his employer, he should always do it with a good grace; with cheerfulness in minor points and matters of taste, with a respectful expression of difference or remonstrance in matters of more importance, and he should refuse to obey his employer's orders only in cases which involve principles of truth and honesty. Besides possessing a varied education, an agent should keep up a knowledge of the progress of the world, by reading and travelling when he has time; he can thus bring home to tenants who are tied down to their farms that experience which will be useful to them, and will also enlarge his own mind, freeing it from prejudices. The disqualifications for the office of land-agent are many. I shall endeavour to point out a few of these, which constant observation have forced on my attention. Generally, the absence of the several qualifications I have enumerated will unfit a man for this profession. Again, special training in many other professions and pursuits is a disqualification. Retired soldiers and sailors do not generally make good agents, though they have some qualities which are useful, such as punctuality and carefulness. Retired butlers and house-stewards may be estimable men, but they are not such as should be set over tenant-farmers. Poor relations, for whom some provision is desirable, would generally cost an owner less if he were to make them an allowance to live at Bath or Cheltenham. Mercantile men are too apt to look at everything in a purely mercantile spirit, not seeing distant or contingent advantages. Farmers who have failed in farming have the disadvantage of undertaking to manage another man's affairs when they could not manage their own; nevertheless, when their failure has been owing to want of capital or unavoidable calamity, and when they are educated and upright men, they frequently make good agents. Head clerks, promoted from the office, are very apt to find themselves in a position for which they are unfit, having been too much bound to routine and detail to take large views of management. They are also apt to be too much the servants of the landowners, and not enough mediators between him and the tenants. Lawyers, attorneys, and writers, though frequently entrusted with the management of estates, are about the most disqualified. Their education, bent of mind, legal way of reasoning and treating all questions, are a positive bar to success in the management of estates, and I consider it an absolute misfortune to the country that so many estates are under their care. From their special training they look narrowly into legal obligations and the rights of property; and from want of experience in country affairs, they are incapable of judging of the propriety of modifying obligations which may be obsolete or inexpedient. Land-owners in Scotland and Ireland, I believe, more so than in England, commit the mistake of making such appointments. To this rule I must confess I know some distinguished exceptions, in men who, having a taste for country pursuits, spend more of their time in the country than in their offices. A town residence, though not an absolute disqualification, is a great disadvantage to a land agent, for though he may be within as easy reach of the estates as a country agent, his business is apt to degenerate into office work, and his visits to the estates and intercourse with the tenants to become more formal than those of an agent residing on an estate, and moving about constantly in the country, and generally such agents depend much more on reports from subordinates and interviews with tenants at their town offices, than agents who meet a tenant in his own field or homestead, and judge from their own observation. Having discussed the agent in his relation to the landowner and to the tenants, I shall make a few observations on his relation to his subordinates, whether they are employed by the owner of each estate under his care, or are his own servants. The office clerk should be a first-rate accountant; he should be strictly honest and trustworthy, keeping the agent's counsel, as he must generally be in his confidence, and is frequently trusted to receive and pay money. The under-agent or bailiff should be a man of much practical experience, active, honest, impartial, capable of superintending building, draining, and other works, and of making out bills and accounts; he should carry out the agent's directions and keep him informed of all that is going on; he should seldom act on his own responsibility, for even going through the form of taking the agent's instructions prevents confusion and mistakes. The wood bailiff should be thoroughly acquainted with all the details of woodcraft, superintending all the operations in the woods, and making valuations of lots marked for sale. Where such a person is not employed his duty may be done by the bailiff or head gardener. The mining agent or viewer must be specially trained for his work, but should not be independent of the agent. He should keep the agent well informed on mining affairs, so that the latter may be able to conduct negociations about mines as he does about farms. The architect, or clerk of works, need not generally be a professional architect, as these have not generally the special experience to enable them to plan and erect farm building economically and suitably to the circumstances of different farms. This office may, however, be combined with that of the bailiff. The solicitor, though not included in the term subordinate, should be accessible to the agent to advise him when necessary; and, besides conducting legal proceedings his duty, should be confined to holding courts, making conveyances, and seeing that leases, agreements, contracts, &c., prepared by the agent, are put into legal form and properly executed. The agent's knowledge of law should be such as will enable him to avoid litigation, but not to conduct law suits. The agent should treat all his subordinates with consideration and courtesy, receiving their opinion with respect, and, if he has to find fault with them, doing it in a kind manner and in private. "Snubbing" before a third person engenders bitterness and resentment, while private correction often produces kindly feeling. By such treatment he will find them ready to oblige him, and probably more anxious to work cordially amongst themselves. Before concluding, I would point to a most vicious system common in Ireland, and also under the courts in this country, that of paying agents by a percentage on their receipts. It has had a bad tendency, and it bears no relation to the work of the agent.

An agent's services are like all others, to be measured by the value of the work done. He should be liberally paid by a fixed salary, and have no perquisites; he has thus no temptation or inducement to act except for the interest of the estate. You may think the duties I have enumerated too many and arduous and the qualifications too high. At all events it should be the endeavour of landowners to find men properly qualified, and it should be the constant labour and study of land agents to approach this standard. If this were so more than it is, the spread of improved agriculture would be more rapid, and an understanding of the community of their interest would be more common among landlords and tenants.

FARMERS' BOOK-KEEPING.

At a recent meeting of the Croydon Farmers' Club, Mr. Stables read the following paper:—I make no pretensions whatever to instruct or teach the art of book-keeping, but knowing that there are a number of gentlemen connected with the club who are well acquainted with the nature and importance of the subject, I do hope for some information to my own mind; and I think, if diversity of opinion be a necessary ingredient to a good discussion, we may anticipate a very interesting one to-night. It has been said that no business can prosper without correct and systematic book-keeping. Whether this applies to farming in its various branches is now the question before us. I think we shall all agree that the better a man understands his business the more likely he is to succeed; and what is a farmer's object in life? Is it not success? As all effects produced are the result of some cause, or combination of causes, ought he not to endeavour not only to understand and comprehend the visible effects produced, but also the causes in operation producing such effects? Whilst I do not pretend to say that book-keeping alone is to do this, I do insist that it is one important means, and to a certain extent a most effective means, within the reach of every farmer. With all deference to my brother-farmers as a class, I do think it is this want of understanding which is the most serious difficulty in the way of progress. Intelligence, and a thorough understanding of all the varied branches of the business, are nowadays quite necessary to satisfactory and successful farming. If we cannot have the good old times, with the old-fashioned prices of corn, we must look to producing cheaper and larger crops. The farmer, of all men, is ever learning, and systematic and correctly-kept books are a most important source of information to his mind. They form a most valuable work of reference; but to be either valuable or interesting they must be correct, and to be correct they must be systematic. There must be a proper set of books, correcting each other, and the small cash-book constantly corrected by the cash in hand, without which your books will be quite incorrect, and if incorrect will be comparatively worthless. With a proper system, however, and ordinary attention, they may be absolutely correct. Some people profess to keep account of the principal transactions, but avoid a regular system of book-keeping, under the false impression that it is too much trouble. I am decidedly of opinion that correctly-kept books do save a good deal of time and trouble, preventing losses, and are much less trouble than loosely-kept accounts. Such accounts cause endless trouble from their very incorrectness. A proper system may involve more writing; but it is not the writing that takes the time so much as the knowing what and where to write; and how very much more satisfactory to the mind to know that the books are absolutely correct than the perplexing doubt as to whether anything has been omitted, without any means of ascertaining whether such is the case. There are books specially prepared for farm book-keeping, with printed forms, heading, index, &c., but I have not yet met with anything printed at all calculated to save time or labour. On the contrary, they are generally intended for one year only. A farm ledger should be simple and comprehensive, should be properly paged and indexed, so that any item, either of expenditure or produce, may be quickly found; and it should be a good large book, to last for many years. The larger and the older the book, the more valuable for reference. The balance-sheet should be regularly made up at Michaelmas. I prefer Michaelmas to either Christmas or Lady Day, because immediately after harvest, before any produce is marketed, we obtain the account of one year's produce and one year's expenditure without being in the least mixed up with other years—a result which cannot be obtained at any other time. Many farmers make no attempt, or any pretensions whatever, at book-keeping, and assign as a reason, evidently satisfactory to themselves, that book-keeping takes too much time and trouble; and yet the same men will work hard all day at the most menial drudgery, whereas ten minutes per day spent in book-keeping might be of more real benefit than a hard day's work. Certainly, a man is to be commended for being diligent in his business. "Seest thou that man diligent in his business, he shall stand before kings: he shall not stand before mean men. But fools die for want of wisdom, and a fool hath no delight in understanding. When wisdom entereth into thine heart, and knowledge is pleasant to thy soul, discretion shall preserve thee, understanding shall keep thee." The poet Gray says—

> "Where ignorance is bliss,
> 'Tis folly to be wise."

But in this case ignorance is not bliss, 'tis misery. Surely any intelligent farmer should be pleased to have all the affairs of his farm in black and white before him, and whilst he is delighted to see the records of the good and profitable—the more profitable and the most profitable—he must also know the worst—for here, most emphatically, "knowledge is power." If he does not fully understand where and how losses come, how is he to avoid them? In addition to the regular set of books I would strongly recommend a debtor and creditor account with each separate field, in a book kept for the especial purpose, showing the exact cost of each crop each year, and per contra creditor the produce. It will be a most instructive book. I will venture to assert that it will prove several things most conclusively—that there is no profit, but a certain loss, in the cultivation of little fields. You will find, in the average of seasons, the expenditure so much higher and the produce so much lower per acre than a good-sized field, that profits are out of the question. You will also find that undrained, wet, summer fallow-land is very unprofitable; that bad or cheap farming does not pay; but that high or good farming, in the average of seasons, does pay. Modern agriculture, especially in connection with modern machinery, is changing the character of the demand for labour. Time was when any man short of a fool would do for an agricultural labourer; but now we must have intelligent labour, and I suppose we must expect to pay for it. But the demand for intelligence is much greater upon the farmer himself. A few years ago a man doing as his father and grandfather had done before him might be considered a most exemplary character, but that wont do now. We must be up with the times, or go to the wall. The man who neglects and repudiates book-keeping will often be penny-wise and pound-foolish; whereas the man who has a proper and comprehensive understanding of the connection between a judicious expenditure and its results, whilst he is not lavish in his expenditure, will ever be ready with a profitable expenditure. I believe if we could only see and understand our business better, we should increase our expenditure to some extent, but we should increase our profit in a much greater ratio. A farmer, of all men under the sun, is most dependent on his judgment, and what so likely to guide and correct his judgment as correct and reliable data upon which to found that judgment? As in all other businesses, a man with a small business may to some extent rely on his memory, but not so if his business be more extensive. And why should the farmer grope in the dark, and guess or jump at his conclusions? A farmer's book should enable him readily and explicitly to answer any question that may arise in his own mind; and in order to do this, all domestic and family expenses should be kept quite separate from the farm accounts. This does not entail any additional trouble; it is simply entering sundry items in a separate book kept for the purpose. Where in some cases a number of farm men are boarded, this may be somewhat difficult, but can be done by charging the farm with the estimated expense of their weekly board, and the farm should be credited with everything produced on the farm, although it be consumed in the house. For instance, when a pig is killed for the use of the farmer's family, it can be entered as so many stones of pork sold to self. By this means you will not only show what the farm is making in pigs, but your domestic account will also be something reliable. The same remarks also apply to everything consumed on the farm, such as horse-corn, pig-meal, and seed sown. For instance, in order to ascertain what is the produce of the oat crop, all the oats consumed must be entered as oats sold to self, and as corn and pulse bought. When oats are relatively cheap we are apt to consume them freeely, but when they are relatively dear, and foreign produce, such as maize, lentils, &c., cheap, as it has been for several years, then we sell nearly all our oats and buy foreign corn. Unless this plan be adopted our books must be very inexplicable. By this means we can know what is the exact produce of each crop, as well as what the animals cost. In reference to farm seed, sometimes the seed sown may be almost exclusively the produce of the farm. At other times we purchase a change of seed wheat, or oats, or anything else; and why should not the account of wheat sold, or any other grain, represent the entire produce of the farm, and the seed required be sold to self, and also entered as seed or seed-corn bought? By this means your farming accounts will be much more comprehensive and satisfactory, much more interesting and instructive at a future period. Thus, you may look over years of accounts of produce, &c., and see the exact average produce per acre, the exact average price per qr. &c.; and who will say that it is not both interesting and instructive? Anything worth doing at all is worth doing well. There is pleasure and profit in keeping correct books, but none whatever in keeping loose accounts. In conclusion, I may be allowed to remark that the man, especially the young man, without reliable data upon which to base his thoughts and calculations, is very apt in unfavourable seasons, or a succession of unfavourable seasons and low prices, such as 1860, '61, and '1862, to become unnecessarily dejected, and perhaps paralysed in his efforts; and in good seasons and higher prices he is likely to become unduly elated. Not so with the man who has registered facts to refer to, who has the experience of years past to guide him. He knows he can not only produce the average of past seasons, but he knows, as surely as effects follow causes, that with better cultivation and improved appliances he can and will exceed the average doings of former years.

Mr. Brown said he had regularly kept his accounts for many years, and he found it highly satisfactory to look over them from time to time. In his books he generally made some short remarks about the progress made, and those remarks often acted as a guide to him. By keeping accounts correctly, a farmer at the end of the year was able to see what had been done during the twelvemonths, and if he found that his business had been successful he could congratulate himself; but if he found that he had been unsuccessful, then he could take measures to improve his position. It was a kind of check upon the farmer's doings. No doubt the keeping of accounts took up a considerable amount of time; but if they entrusted them to a young person they became very instructive. He had not kept accounts of all trifling items, and in consequence they would say perhaps that he had not kept them correct; but the way in which he kept them answered every purpose of his own. Had he not kept his accounts pretty correctly he should never have got off the property-tax in 1851. By showing correct accounts, he got off the property-tax for two years. When his income was under £200, he got clear of the property-tax, and thus saved himself £5 a year. When he went to appeal he showed that he had lost £250 clear money. "But," said they, "how about housekeeping?" He confessed he never kept a housekeeping account, but he was sure it would not reach £250. He considered his housekeeping came to about £200, and looking at those circumstances he was struck off the list. They would thus see it was advisable to keep correct accounts. He generally made his accounts up to October. In 1851 he found his expenditure between £450 and £460; but last year it was nearly £700. Still, he got a fair return. He believed the more a farmer spent on his land the larger would be his returns. He considered it would be well for every farmer to take account of all items, and balance them every week or month.

Mr. Cross said in keeping his accounts he invariably kept a diary of the weather, which he found very useful.

Mr. Brown said when he mentioned that he had expended £700 for labour last year, he included the cost of hiring a thrashing machine.

Mr. Humpidge: Do they find men as well as the machine?

Mr. Brown: Yes.

Mr. Hunt considered the subject of keeping correct accounts was of more importance than many persons considered it. Numbers of farmers did not keep accounts, and instances were frequent where farmers had said to him, "We must trust to your book, for we do not know how our accounts stand." If he did not keep books, they would often both be in the wrong. For the last twenty years he had kept books in farming. When he commenced as a farmer he kept a diary of everyday work on the farm, and this he continued with advantage for seven years. The books he kept now were what he called the board-book, the day-journal, and the ledger. He always kept a separate debtor and creditor account, and one for produce, stock, pigs, cows, horses, &c., and of what he bought and sold, and at Michaelmas he took stock. His was a system he had adopted with advantage, as it was exceedingly simple. With all transactions he had he sent out tickets, keeping the counterpart in his board-book. From that book he entered the transactions in the day-journal, and from the journal into the ledger. By means of his books he could take stock every year to within a few shillings. All that was wanted was three books, which could be bought for about £1. and would last many years. To illustrate the evil effects of not keeping correct accounts he might mention that he knew a farmer at the present time who had a dispute with another about the supply of some hay. The dispute was that a load more had been supplied than was acknowledged; and in consequence of having no accounts he would no doubt lose the value of the load of hay. He (Mr. Hunt) had sold as many as 200 loads of hay in one year, and had never had a dispute, and that he attributed to his having kept correct accounts.

Mr. Wilson said he had hoped to hear more as to which systems were the best for farmers to adopt; but it appeared most of them had systems of their own. In some respects his plan was similar to that adopted by Mr. Hunt. He kept a diary of everything that took place upon the farm. He had a ledger besides, and one of Peat's account-books. The account-book was a very simple one, and contained separate accounts for every month in the year—one side for receipts and the other for payments. He also kept a weekly wages account-book and stock-book, in which details were kept with regard to the sale and purchase of stock, grain, &c.; and this he balanced at the end of the year. Then he had a field-book; but the accounts of the fields he certainly found difficult to keep. However, he managed to keep them pretty accurate, as Mr. Fuller could tell them, as he had just valued him out of 50 acres. One remark had struck him, and that was that one made by Mr. Brown about the income-tax. He did not know a farmer could get off the tax. He thought there was no appeal for them.

Mr. Stables said a farmer could get off now, if he proved that his income was below £200 a-year.

Mr. J. Taylor thought the great object of book-keeping was to enable a man to see how his accounts stood from time to time; and he believed what applied to the mercantile dealer applied equally as well to the farmer. There were a great many systems of keeping accounts; but some of them were very intricate, and he considered a farmer's life would become a burden to him if he were to adopt one of them. The foundation of book-keeping for a farmer was an account-book, a journal, and a ledger. If those were properly kept, he believed a man's affairs might be pretty accurately ascertained. Other books might be kept, but he considered all others subsidiaries. Farmers engaged in the practical part of their business did not want to spend much time in making up accounts, and therefore the more simple the system the better.

Mr. Humpidge said he must confess the account part of the business in farming puzzled him the most. He had never yet found out a way to keep correct accounts in a simple manner. Mr. Stables had referred to a debtor-and-creditor account for each field. Now, he considered that a most difficult thing to do, inasmuch as it would be necessary to keep a separate account for corn, another for labour, and so on for each field. A day-book might certainly be kept, which would serve as a reference; but a debtor-and-creditor account for each field seemed to him a most intricate matter. Mr. Stables said it could be done in a simple manner; but he must confess he had never found it so. The system he adopted was to keep an account of what stock, sheep, cattle, horses, pigs, &c., he bought, and the same of what he sold; but as to the cost of the keep of those animals, he really did not know. They would, no doubt, say that was insufficient: at any rate, that was as much as he had attempted. The difficulty in keeping an account of the cost of food was very great, because they might want to charge fields with their sheep and stock; and when they did that, how could they tell what they consumed?

Mr. Wilson asked if he did not keep an account of the quantity of oilcake consumed?

Mr. Humpidge said he did. He kept that in an account as artificial food.

Mr. Wilson suggested that he should put that against the manure.

Mr. Humpidge considered that a loose way of doing business. To keep accounts correctly, he believed, would require a large amount of time, and, on large farms, would involve the necessity of employing a clerk. His books were a cash-book, a journal, and a ledger, from which he could understand pretty well how he was going on. He found his labour-journal a very useful book, in which he kept an account of work done by every man during the week; and by it, he could ascertain what each week's labour came to. He considered it well to make note of the weather; but even supposing they did not, their operations from a labour-journal would tell them whether it was wet or not.

Mr. Wilson said they could get Peat's account-book for 2s. 6d. His memorandum-book gave him an account of the weather, and told him what had been done each day.

Mr. Streeter said the best and most efficient system he knew of was that used at the Cirencester College of Agriculture, and which is fully described in the Royal Agricultural Society's *Journal*. The system was simple and clear. The items or heads in the ledger might be extended or not, as the farmer might desire information upon any item, or income, or expenditure. The labour-book of the college he did not deem requsite to adopt, as the trouble on a large farm of entering every man's labour daily was too great.

The Chairman, Mr. R. W. Fuller, said it happened in the early part of his life he obtained an appointment in the Court of Bankruptcy, and while there he had many opportunities of observing and considering how it was men stumbled in their business. It occurred to him that many of the mistakes made in life were not through extravagance, but through the men not knowing in what position their finances stood. That opinion was strengthened by what was said by one of the commissioners. His words were: "If men kept their accounts better, we should have far less come into this court." He agreed with the remarks made that, in order to keep accounts properly, several books were required; but it was necessary those books should be clear and simple. He believed Michaelmas was the proper time to take stock. He had never seen the books referred to by Mr. Streeter; but he had used Beasley's book, and had found no difficulty whatever with it. It set forth the whole of the produce, and showed a distinct account for labour. In fact, it was one of the most perfect books he had seen. He had one in his possession he should be most happy to show any of the members. He felt the subject they had discussed that evening was a very important one; and he was sure they were all convinced that correct book-keeping in farming was as necessary to success as in any other business. The business of life was success; and he believed that success was rendered far more certain when good accounts were kept. Let them keep their books correct, and they would show them when they were successful, and pull them up in time when their business was declining.

TEXTLESS NOTES.

BY A CROTCHETY FARMER.

I have been indulging myself with a stroll through the avenues and the galleries of the Smithfield Show. I was going to say a "quiet" stroll; but that, in remembrance of the crush and the crowd, the bustle and the buzz through which I had to force my way, would scarcely have been consistent with fact. Just before the opening of the new Hall in which the show meetings are now held, I in common with many others used to look forward with a degree of complacent pleasure to the time when the crush and confusion of Baker-street building would be changed for the ease and convenience of the Agricultural Hall. But I guess we have been somewhat disappointed; a trifle less dense probably the crowd is, but as for ease of movement we have none of it. The expansibility in the building, so to term it, has been in much less proportion than that of the crowd which frequents it. I confess I had almost if not quite as much difficulty in forcing my way along by far the largest proportion of the length of avenues as ever I had in Baker-street. This, of course, is delightfully gratifying to the directors and the shareholders of the Hall; but if it was all the same to them, it would be vastly different to me if either they had constructed a larger building, or got a slightly smaller number of people to come to it. For, although not having in person the portly bulk of some of those I saw "larding the lean earth" as they waddled along, examining stock as portly as themselves, but who were, for the time at least, much more fortunate than they, inasmuch as they had either to stand or lie only—although not having, I say, the portly bulk of some of the visitors to the show, still such bulk as I have is in proportion to the strength which supports it, and at times I find the bulk quite big enough and the strength quite small enough for picking my way through some of the more densely-crowded places in the late gathering. At such times I confess to being crotchety enough to wish for the breezy down or the open fields in which our leading agricultural shows are held; to see the clear sky above me, in place of iron girders, and dim, dust-strewed glass, and to have the fresh breezes blowing around me; and yet in all justice to the managers of the show it is right to state that, considering the vast amount of human and "bestial" breath exhaled in the building, the atmosphere was wonderfully pure—certainly in this respect a vast improvement upon the Baker-street building: the recollection of the air in that place, which too often I was condemned to breathe, positively gives me a headache—at all events brings to mind the head-aches I had in consequence.

Having said my say as to the building, I must turn now to say something, very briefly however, as to its contents. And first, as to the crowds frequenting it, to which I have already alluded. Where do they all come from? They cannot be all—indeed, a glance at many of them will show that they are not all—directly connected with agricultural pursuits. That Dundreary swell I still see, "in my mind's eye, Horatio," who is gazing drearily (pardon the vile pun!) at things which neither he nor, in his opinion, any other fellow *can* possibly understand, is not a farmer; nor are those gaily-dressed ladies, with an amplitude of skirt, and the very reverse condition as regards bonnet, by any means accustomed to trip on the lea, to milk cows, or make up butter: they have more to do, I fancy, with dress than with dairies, with flirtation than with fields. Not a small sprinkling, moreover, of other classes are there, who unmistakably show that their minds are much more bent on the pleasure they are to get by a visit to the show than on any business-profit, more or less direct as the case may be, that they look to get out of it. All this, however, militates very much against a theory or a belief much dwelt upon by certain classes of political or non-political writers, who maintain that there is in the public mind a thorough apathy and indifference to all matters agricultural; that the public interest is concentrated upon the cotton and the commerce, the banking and, shall I, crotchety individual as I am, say the *bubbles?* of the nation; that as for farming and all connected with it, there is "nothing in it." I, for one, will not believe it: I believe, on the contrary, that we are essentially a country-loving people, having a close—nay, an enthusiastic—interest in all that concerns green fields, waving corn, and "the cattle upon a thousand hills." The smug, or snug, citizen—which, O learned reader, is the correct quotation, "smug" or "snug"? "Smug," I believe, whatever that may mean—sitting at desk or waiting at counter, looks forward to the time when he will have his box in the country—not in the town, observe; while the merchant of higher grade, the man great on 'Change, has either bought or is going to buy an estate, to start a model farm, and will shortly have his mind taken from the "stock," the "bulls," and the "bears" of speculation, to animals *quite* of another kind. Nor is this by any means to be overlooked in any estimate we may chose to make of ourselves as a people, and of the influences at work which mould and make the nation. It possesses a wonderful power, and exercises a no less wonderful influence in making us what we are, an eminently conservative people. I am sure no one will amongst my readers be so crotchety as to suppose that I am crotchety enough in this paper to use the term "conservative" in other than its right sense—in an economical, in fact, not in a political sense. Of course, all this interest in country matters makes those who flock to our agricultural shows, but who are not agricultural people strictly so-called, take an interest in country things. Else how is it that nearly every one who examines the fat, and in too many cases apoplectic cattle, sheep, and pigs which grace and grunt in the pens of our shows, deems it apparently to be a matter of duty to poke and pinch, and shall I use a Lancashire phrase, and say, "punse," *i. e.* punch, the sides of the unfortunate animals. I should like much to know what is the prevailing idea in the minds of those who, not being really farmers, go through these, to the animals painful processes aforesaid—what result do they anticipate learning as the consequence of it? I suppose it is because they simply see farmers—men who cannot by any possibility be taken for anybody but farmers—do it, and to do it also gives them a kind of a farming look, which upon the whole they seem to think is "quite the cheese"—a very appropriate simile this, by the way, in a paper upon an agricultural show. Much fun, in my own quiet crotchety way, have I had to see a party come up to the wretched victim of a pig, too fat to kick, too lazy even to grunt, and go through the processes I have already named. Young gentlemen as a rule, of a certain age, take to the thing quite boldly, and, guided however by no scientific hand, punch or pinch the poor wretch; as for the "points" of an animal they of course are ignorant of them. Ladies, especially those of an uncertain age, have a quiet poke with the points of their parasols at the fat sides before them, a poke which one is not sure whether pleasure or pain is derived from it—I rather think the latter: for a latent idea must be present with them that this poking and pinching of the poor animals must be anything but a pleasant thing to them. And I confess that I am crotchety enough to hope that the day is not far distant when these amateur endeavours to try the quality of stock exhibited at our shows will be "a custom more honoured in the breach than the observance." I can quite understand how a man truly interested in a business point of view will use all means in his power to know the value of stock he is examining, although a thoroughly learned man in bucolic matters does not require to do much in this pinching and punching process: he knows more by the look than by the feel, and what he does in this way is almost literally a "touch;" my agricultural readers will know what I mean by the term I have here used. Was he or was he not a clever fellow who said that man is eminently a cruel animal—that is, one delighting in the pain and misery of others, and careless especially of the feelings of the lower animals? I believe this is thoroughly correct, so far as regards boys, and we men are only children of a larger growth. I saw a few *fat boys* in the show. I may here remark, by way of a suggestive parenthesis, it is possible that all this amateur work of "handling" the stock of our shows is but the gratification of an inherent natural cruelty; for it is cruel, no mistake about that; and crotchety as this statement may be deemed by many to be, it is true nevertheless. And seeing that the exercise of this amateur handling is productive of no real practical good—the parties exercising it cannot learn anything by it, inasmuch as they do not know *what* it is they wish to learn—I would be most delighted at future shows to see less of it. My Lord Dundreary, my Lady Flirt, Mr. Citizen Smug, fancy yourselves, if, indeed, such a fancy is allowable in these days of refined feeling, in a kind of land of Laputa, in which you were the exhibited subjects in a giants' show, the men of Anak having a strong desire to pinch and punch your ribs, or the fat which was on them: I rather think, like the boy who was being thrashed, you would call out as he did to his surprised mother, "*Oh don't, it's sore!*" Now that boy's mother meant it to be sore; but surely in these days of refined feeling, the phrase of course cuts both ways. You do not mean all your amateur pinching of these obese animals to be a source of pain to them; but it is, for all that. Pray, ladies and gentlemen, take all this to heart; and although a crotchety individual tells you of it, he does not because he loves crotchetiness more, but because he likes cruelty less. Cruelty is cruelty, in whatever form disguised or painted.

But the true "fun of the fair," to one really initiated into the practical mysteries of farming, is to watch those who are not, during the process of examining the machinery and implements of the show. Here the fun is legitimate, for being concerned with things which cannot feel, we have no such unpleasant reflection coming in to damp the ludicrous absurdities so observable in the stock department, when its victims are under the hands of the pinching public. Can you, reader, "or any other man," tell me what can be the attraction to an eager crowd of ladies and gentlemen assuredly most innocent of all that concerns practical farming, to watch for a series of wonderfully long minutes—I mean long to the poor man who operates the machine for them—a straw-cutter or a turnip-cutter at work? Notion they can—I know it in their faces—have none of what the machine really is, and how it does its work; but there they stand, most eagerly watching length after length of hay or straw cut, or turnip after turnip bruised or sliced. How is it? —as a Frenchman would say, "How arrives it?" My theory is this: it gratifies the inherent love of destructiveness which all men more or less possess, to watch those machines at work: for just as we know with what an intense delight Johnny, the darling of his mother, the dread of his nurse, steals away with a piece of paper—the more valuable this the better—and a large pair of scissors, and cuts shred after shred in the dear delight of nothing else but seeing the paper gradually destroyed; kindred to this, I take it, is the feeling with which many watch the working of cutters of straw or slicers of roots; for quite sure am I that these watchers turn from the entrancing spectacle with a sense of the hopelessness as to knowing, or even being able to know, the nature of the machine which affords them the delight of looking at its destructive—to them—work. But I like to gather lessons of good from every thing I come across, and from these occasions I learn the grace of a ready and a patient courtesy. For this is most decidedly, and, I may say, most beautifully displayed by the attendants at the stands. How weary must the showing be of the same machine, explaining its ever-recurring mechanism, turning the same handle, watching the wheel take what, without incurring the charge of profanity, I may be permitted to call, with Mons. Mantalini, its ever "demnition round;" and although all this can be done, and is done, from a sense of duty when parties are likely to buy the machine, it cannot be done when they know that no one in the eager group before or around them is likely to do so, not knowing what, indeed, to do with it if they did buy; and yet, with a patient courtesy, they go through the work as readily, nay, I believe, more pleasantly, than if they knew they would get orders for the machine. They talk of the politeness of Frenchmen! can it not be matched here? Truly, I am crochety enough to be proud of the doings of my countrymen, even when displayed on what some may call the trivial occasion I have alluded to. I call nothing trivial, or unworthy of notice, which brings into play the finer feelings and the courtesies of our nature.

But what has all this to do with the strict and sober subjects usually treated of in a journal such as this? Possibly not much: possibly if the method and order employed are looked into and through, possibly a good deal. The purpose of an article in a journal is not always to instruct: sometimes it is to amuse—sometimes to do both; for the matter of amusement may be productive in itself of instruction. If I have failed in this paper, up to the present portion of it, in doing either, it is perhaps not to be wondered at. What, indeed, can be expected from a crotchety man like myself? At all events, I can say of my article what Aubrey said of his wife—"She is a poor thing, sir; but she is my own!" And this, good reader, is what not every writer can say of his article.

The stock department of the show affords matter for grave, yet gratifying, consideration—grave, when we look back upon the dreary and disastrous year which has lately gone, and what ravages the disease has made in our herds—how it quite stopped the stock part of the show the preceding year, and very nearly stopped it last year: grave considerations, inasmuch as we have yet enough disease amongst us to tell us that it has not, as might be inferred from the Orders of Council and prayers of archbishops, ceased from amongst us, and that if we do not take care things may be as bad as ever. But the stock department of the show of last year afforded, as we have said, matter for gratifying considerations as well as for grave ones—gratifying, indeed, as it affords the best answers to the prejudiced, I was almost going to say wilfully misrepresented, views that some continue to hold up as the correct one, namely, that farmers, as a body, have no pluck, no energy. Have they not, indeed! May I say, How do you know how much they have? The position the stock of the last show occupied was, under the disastrous and depressing influences of the past year, very remarkable, and is one of which all concerned in agriculture may well be proud. It speaks trumpet-tongued in favour of the energy of our farmers—volumes, to use an ordinary phrase, and, to follow up the simile, portly volumes too, as best befits the important subject of which they treat. I could say much about the stock; and, because I do not say more, it is because so much has been already said in the pages of this Journal, that the necessity is taken from me to say it. Moreover, I am such an erratic individual with my pen, or possibly with the promptings of my mind, to which my pen gives a body and a shape, that I might say something so dreadfully crotchety that I had better leave it unsaid. For instance, I might say much as to certain considerations which the sight of over-fed, apoplectic animals gave rise to—considerations physiological as well as economical. I might say something as to considerations involved in the transit of our animals from place to place; of the mode of housing and feeding, and of the principles of breeding, and of a thousand-and-one things which influence, and influence materially, the well-being of our stock, and which retard or promote, just as they are neglected on the one hand or attended to on the other, the development of circumstances influencing the propagation of disease from one part to another, but upon all of which I for the present say nothing. And he is a wise man who says little; which, by the way, is a very crotchety compliment to myself, seeing I have said a good deal to my readers, and may probably say more.

In the implement department there is not much novelty to notice—probably on the whole a healthy state of matters, calling for the words of congratulation rather than those of regret. But although it may be said that there is danger in the straining after novelty, inasmuch as it may lead to unsoundness of principle, yet it should not be forgotten that there is danger also where a body of men who have at one time been notorious—that is not a good word to use, as it brings me in conjunction with a rather odious word not generally applied to honest men; I shall therefore say, distinguished by their efforts in introducing novelties and useful ones—take action, or rather cease to take action; who change their motto, or seem as if they would like to change their motto, from "progress" onward! onward! to "rest," with I presume, the finish of the celebrated formula, "and be thankful." Not that I say here, or wish to convey the notion that I could say that our implement makers have got to this position; truly, truly I am not so crotchety as this; to say in effect that they are satisfied with past efforts, and believe they can make no more. All I wish to convey is, that in escaping from the Scylla of too much novelty, there is a danger of falling into the Charybdis of none at all. By the way, has it occurred to any of my readers that in the implement galleries of the Smithfield Club Show we have a commentary—of what kind I at present say not—upon the oft-discussed question of the prize-system, is it good or bad? If any one has thought that it is good, is he, because he has a right to think so, to be set down along with me as a "Crotchety Farmer?" I am crotchety enough to believe very strongly in a certain way on this very point, about which more anon!

TIDINESS ON THE FARM.—By no class of men is the useful maxim, "a place for everything, and everything in its place," so frequently disregarded as by farmers. You enter a merchant's store, and are struck at once by the evidences of order and method, everything being, of necessity, so arranged that he can lay his hand upon the precise article needed, without the delay of an embarrassing and vexatious search. In the office of the professional man, and in all departments of business, the imperative necessity for order usually secures it. But with the farmer the case is often notoriously different. His farm-yard, his barn, and every part of his premises, are often conspicuous by the entire absence of neat arrangement and general tidiness. The waggon and implements, sometimes even those of an expensive kind, whose cost might be supposed to induce a little extra care, are exposed to all varieties of weather, loaded with dirt, and out of repair. The buggy, appropriated, perhaps, as a convenient roosting-place by the poultry, is covered with an unseemly coating of mud and other defilements, which completely hide the original paint and varnish. The smaller articles are scattered all over the premises. The grain bags, in holes and without strings, have to be hunted up every time they are needed; and each muster presents an unaccountable diminution of numbers. Now all this is not only offensive to the eye and to good taste, but is thriftless and wasteful. A want of order and method is to farming, as to every other trade, a cause of serious loss. The farmer will tell you, in excuse for the state of things we have indicated, that he has no time to be particular. But, if he judged rightly, he would find that, looking at the matter only in that light, he loses more time by his negligence than it would cost him to attend promptly to needed repairs to arrange his tools and implements, and keep everything in its proper place. How often in every such farmer's experience is a whole morning or more lost by the neglect, in the first instance, of a little timely repair! Or how often does the clumsily patched-up implement give way, and occasion repeated delay, spent in trumping up some inefficient expedient! How often is time lost in a vexatious search for some tool, mislaid when last used! If there were only one man at work, he might possibly remember where for his temporary convenience, or in his hurry, he threw down the article as soon as its immediate purpose was served; but, as on almost all farms several hands are employed, the probability is, that when the next thing is wanted, it will be by some other party, who will be totally at a loss where to find it. Depend upon it, the time spent in at once restoring an article, after using it, to its proper place, will, in the end, be time saved, that the delay incurred by a thorough and efficient repair, at the outset, will obviate many subsequent and more serious delays; and that the hours devoted to keeping implements clean, and in good working order, will tend materially to their durability and efficiency, and ultimately prove to be true economy. The importance of cleanliness, where live stock is concerned, can hardly be exaggerated. The filth that too often accumulates in hog-pens and stables is not only unseemly and disgusting to all concerned, but exerts a most injurious influence on the health of the animals. The plea of want of time to attend to the niceties of fancy farming in this particular only betrays the so-called practical farmer's ignorance of his business; and the neglect of scrupulous cleanliness in regard to his stock will damage his pocket not less than his personal refinement. The farm-yard, sheds, and places appropriated to stock, should be kept in such a condition that the owner need not be ashamed to invite a lady to inspect his premises. The thrifty, careful farmer, whether he be a man of refinement and education or not, will see to it, on the score of his interest, if for no other reason, that his implements are preserved in good repair, and bestowed in their proper places; that the roofs are weather-tight; that his stacks are neatly finished and thatched; that there is no wasteful scattering of fodder and litter; that his stock are sheltered, and duly cared for in the essential matter of cleanliness; and his farm will present, in a thousand nameless but not unimportant particulars, the indications of a tidy proprietor. A stranger may frequently give a shrewd guess in regard to a farmer's success, from the aspect of his farm-yard; for, a habit of negligence in one department is very apt to extend to others; and untidy premises will generally be evidence of a slovenly and unprofitable mode of farming.—*Canada Farmer*.

SHEEP TICKS AND RED LICE.

BY A PRACTICAL FARMER.

Next to the "scab in sheep" as affecting the skin, and therefore the comfort and progress of the sheep, are "sheep ticks" and "red lice" The former is a large and formidable insect, its body being of a dark drab colour, and its legs and little head brownish; sometimes growing to the size of a small Heligoland bean, and its bite is very sharp and inflammatory, nearly equal to that of the large gad-fly. It is very tenacious of its hold, and can with difficulty be removed from its place on the sheep, and it is said to be so tenacious of life as to exist for many months in the wool-pile. It is tolerably active, and soon creeps in amongst the wool on being placed upon the sheep, and generally commences an immediate attack on getting down to the skin. It will scarcely bite till its head and proboscis are almost buried in thick wool next to the skin. When accidentally left on the human frame it will seldom bite, unless in contact with the hair or a woollen waistcoat, &c., &c. Its instruments for piercing the skin, and almost burying its proboscis and head within it, are three in number; but it adheres firmly to the skin by means of its six legs, which are armed with strong double serrated claws. When the wool is long and thick-set, its movements are very confined, and it chiefly feeds upon the skin in its immediate position; but when the wool is taken off at sheep-shearing, it displays great vivacity and quickness, and will speedily run all over the animal in search of a woolly place in which to hide its head. It propagates rapidly, and the eggs are of comparatively large size, resembling a small brown chrysalis. On this account it is a difficult thing to free the sheep from this tiresome plague—no single dressing, however efficacious, will do it. It may kill the living ticks, but not all the eggs; hence, repeated dressings are requisite. Perhaps the best course is to repeat an effective dressing at the end of the month from the first application. I have frequently tried to destroy these ticks by dressings or salvings of mercurial ointment, as for scab, but without any certain result. Very many ticks escape, and the sheep are soon as much troubled as ever, which has led me to think mercurial ointment for ticks in sheep is a misapplication of a remedy. Not so for red lice—those it will destroy satisfactorily, if not thoroughly. My own practice is to use a dressing of arsenical preparation, consisting of 2lbs. of arsenic, 1lb. of soft soap, and a small scenting of asafœtida, dissolved by boiling in four gallons of water, to which we add before using about from twelve to fifteen gallons more in dilution, and generally applied to my old sheep from a bottle having the cork perforated to hold a large goose-quill, through which the liquid is jerked on to the sheep in every part, taking care to open the wool, so that much of it is deposited upon the skin, using two wine-bottles-full to a sheep. My lambs are invariably dipped in the liquid (greatly diluted, as stated above) a few days after "clip-day" (sheep-shearing). The mode of application to the sheep is very simple. The head is generally held between the legs of the operator. He, first, with a short stick, divides the wool along the back, jerking in the dressing as he proceeds; next, on either side as low down as can be effectually drenched. The sheep is then laid down, and the remainder of the sides and belly finished. The ear is marked to denote being done. The lambs are dipped in a tub, as in Bigg's apparatus, and are well squeezed after. The asafœtida deters the attacks of blue-bottles and other flies. It often appears to give much trouble thus to dress a flock; but depend upon it, these and similar dressings will amply repay the trouble and outlay, both in the fleece and the well-doing of the sheep. I have used Bigg's mixture with great success. The present winter up to the past week or two has been extremely favourable for the increase of these vermin; it therefore behoves flockmasters to give especial attention in this particular to their flocks.

"*Red Lice.*"—These little insects are very minute, and, so far as my observation goes, not easily discernible. When a sheep is greatly infested by them, any novice may distinguish their attack from any other of similar character. The animal is continually showing its restlessness, rubbing itself and "nabbing" its wool, and pacing and even rolling itself about, testifying thus its uneasinesss. The skin and wool, consequently, are soon affected. The skin looks inflamed: the wool becomes semi-cotted; still there is no scab, although the animal's movements lead to that conclusion. A careful, well practised eye would now discern "a species of louse peculiar to the sheep, which occasionally exists in almost incredible numbers, associated with common scab, or connected with, or producing an eruptive disease somewhat resembling scab. This louse (the *Niphobosea ovina*) is small and active, and of a brown colour, principally tormenting lambs and hog-sheep that are out of condition. Professor Gobier relates a case in which these insects were so numerous that, after the lambs had lain a little while in the sun, they appeared to be of a brown colour. All the lice by which they were infested had crept to the outside of the wool." These I believe to be the identical insects which country shepherds call "red lice;" and their increase and attacks are almost as bad as those of the little wretches which actually cause scab. Both act most injuriously upon the sheep affected by them; but as the little scab wretches get through the skin, and live beneath it, they are more difficult to kill than those "Red Lice" that live on the surface. The same liquid preparation I have named for "ticks" is equally applicable and destructive to these little pests. The lambs to be dipped: the older sheep may be more economically dressed as I have named. In the district from whence I write, it is called "fag-water:" hence the provincial term, "fag-watering sheep." In dipping lambs, we dilute the boiled preparation named above (*i.e.*, 2lbs. of arsenic, 1lb. of soft soap, a little drop of asafœtida, and four gallons of water), by the addition of at least 25 to 30 gallons more water for dipping, and about 15 to 20 gallons for dressing by bottle. Arsenical poison is a dangerous application: it is therefore at all times advisable to have the mixture weak enough. If too strong, a sickly lamb is likely to be destroyed by it; and a very little arsenic kills a louse or tick, if only taken. As many of these little insects will be left upon the rubbing-posts or fences to which the sheep resort, it is desirable to use the remains of the dipping liquids in dressing these places. Ticks are seldom found elsewhere than upon the sheep. Other remedies are resorted to for the destruction of these lice. Tobacco-water is effective if made strong, and carefully applied. Mercurial ointment is a certain cure, if the dressing is very heavy. Hellebore infusions are spoken of as useful; but I have not tried it. One thing all flockmasters may be assured of—that, if a cure is to be effected, either in scab, ticks, or lice, it must be done by an outward application upon the skin. Medicines are of no avail. Great watchfulness is necessary, and repeated dressings may be requisite. If so, they must be applied; and the sooner the better, if any symptoms or signs of itching return. No animal pays so well for careful attention as the sheep. He is liable to so many troubles and many dangers from which he ought to be relieved, and that as early as possible.

PREMIUMS FOR LABOURERS—AGRICULTURAL STATISTICS.

The annual meeting of the West Herts Agricultural Society was held on Jan. 29th at Watford, the Earl of Clarendon, the President for the year, in the chair, who after explaining that illness had prevented him from being present at previous meetings, congratulated the meeting on the success of the society, and dwelt on the numerous benefits of such associations. They brought people of all classes together, and made them feel when engaged on an object of common interest that they are equal. After referring to various subjects connected with the management of the society, Lord Clarendon said: The committee are particularly anxious to call the attention of the tenant-farmers to the prizes given for the best-cultivated farms. Prizes of £50 and £25 are worth competing for. They open a wide field for competition. The obtaining of such prizes is most honourable, and I cannot conceive anything more beneficial to a district than a number of men pitted against each other, and bringing their knowledge to bear on the increase of the produce of the land. There is one class of prizes which I hope will never be eliminated from our list, and which I hope to see extended in number and value—I mean the prizes for labourers (cheers). I allude to this because these prizes have often been made the subject of ridicule, and attempts, although happily unsuccessful, have been made to discourage the donors, and to deprive the recipients of these prizes. It has been said that it is degrading to a man to receive a prize of £2 or £3 for a long course of good conduct under circumstances the most trying. But I think these critics do not understand the mainspring of human action; for in all of us nature has implanted a natural ambition. There is no one who is worth anything who does not aim at distinction at raising himself in the estimation of others. The Victoria Cross is given as the reward for daring acts of valour. Admirals, generals, successful diplomatists, adventurers—those noble men who have made geographical discoveries, who have laid down the Atlantic Cable—receive the decoration of the Order of the Bath. It would be absurd to measure these distinctions by their mere money value. The same remark applies to the labourer. He cannot win battles, or sign treaties, or explore distant countries, but he can so conduct himself as to be an example to all those around him, and confer a great benefit on his locality (cheers). The man who lives for many years in the same place—the man who brings up many children without relying upon the parish for relief—the man who in provident societies or savings-banks lays by for a day of trouble—the man who gives proofs of intelligence, sobriety, and industry, and of having according to the best of his ability performed the duties that devolve upon him, deserves the greatest encouragement. It is incumbent on a society like this to seek out such men, to publish their characters, to reward their merits; and I think when the prizes are given they should be accompanied by a diploma recording the causes of the gift, which would be to the man's family his Order of the Bath or his Victoria Cross (cheers). But this matter needs no argument. The fact is that the labourers value these prizes—that they compete for them most willingly—

that they are proud of them—and that is quite sufficient for us (cheers). I wish now to say a word on a matter to which I attach considerable importance, and that is the subject of agricultural statistics, in which, hitherto, England has been most lamentably behindhand. I think there is no one who reflects on this matter who can deny that a correct collection of facts, showing the actual state of agriculture and its improved condition from one year to another, must be of the greatest importance to the nation at large, and most especially to the owners and occupiers of land (Hear, hear). Upon most matters that affect the highest interests of the country we are in the habit of collecting the most valuable returns and information, and drawing from them the most useful and interesting lessons. Upon our trade and commerce, our exports and imports, our currency, our population, our criminal jurisprudence, and, in short, upon everything that can throw light on the moral and social condition of the country, we have for years past been in the habit of collecting and acting upon the most reliable information we could obtain. But it is upon the produce of our soil, upon the relation between production and population, upon that knowledge which will impart to us the amount of the production of our own soil and how far we must rely upon foreigners for our food, what are the regulating causes of price—upon everything which it is most important for the producer to know, the agricultural interest have refused to be informed, and have preferred to remain in ignorance and darkness (Hear, hear). This is a strong thing to say; but I am justified in saying it, and I will tell you why. Having laboured much abroad, and having been aware of the enormous benefit which foreign countries derive from this accurate collection of facts, particularly France, I was anxious, when I was in a position to carry out my intentions, that my own country should be similarly benefited; and when I was President of the Board of Trade, in 1847, I caused a bill to be prepared and laid on the table of the House of Commons authorizing the collection of agricultural statistics. But it met with such bitter opposition, and the prejudice was so strong, and the measure was considered so odious and inquisitorial, that we had to give it up. But when I was appointed Lord-Lieutenant of Ireland, I determined to try the experiment in that country, and a system was organized which worked most admirably: and there are not in Europe agricultural statistics so complete and reliable as those obtained in Ireland. The quickness and penetration of the Irish people saw what the value of such information would be to an agricultural country; and the readiness with which they lent themselves to procure this information called forth general thanks. These admirable statistics have for many years been a standing reproach to Great Britain. But at length prejudice seems to have given way to common sense; and the Board of Trade has been able to organize a system which is beginning to work tolerably well; and a return for 1866 shows the total population, area, abstract of acreage under crops, bare fallow, and grass, and the total number of cattle and sheep in each division in the United Kingdom, in each county, and in various foreign countries; so that we shall not only know what we are doing, but shall be able to compare our progress or decline with that of most foreign countries, and shall be able to judge what will be the prices at home and abroad. The answers to the inquiries in Scotland have, I believe, been most satisfactory. But in England there is a great deal to desire; and my reason for venturing to call attention to the subject is that I believe it to be the duty of everybody connected with land to aid by voluntary returns and other means the very useful work in which the Board of Trade is now engaged (Hear, hear).

THE MOLE.

Of all the quadrupeds connected with the farm and the garden, there is none more singular in its nature and habits than the mole.

It is very rarely indeed that a mole sets foot upon the face of the earth at all, neither does it breathe our air in the ordinary acceptation of the word, for it is neither warmed by our sun nor cooled by the breeze which brings us health. The mole lives in a perpetual calm, and inhales the heavier gases and earthy vapour that would kill other animals. In gathering its daily bread, the mole robs no man of the produce of his labour, for it eats neither grass nor grain, herb nor flower. Marvellous as it may appear to our every-day notions, it is strictly true that, from the creation of the world to this day, moles have subsisted without tasting of the fruits of the earth; and whilst the farm and the garden have been robbed by birds and beasts, both wild and tame, the mole has been all the while inhabiting the farm and the garden, silently working under our feet as if by stealth, yet no one can say that the mole has pilfered even to the value of a single barleycorn.

By some extraordinary instinct, the mole has prehension by which it can descry afar off the newly-manured field, where the earth has but recently become fertile, and cultivation has only just reclaimed the desert waste to the rotation of roots and corn. Here the mole will shortly be found, by whatever means it may have been transported thither, tunnelling its subterranean driftway downwards to the watercourse, which it visits daily, thereby securing one pipe drain open throughout, always securing for itself a comfortable home in the deep dry earth, purchasing, at no small cost of excavation, in the truest sense of the phrase, "a place where it may find rest for the soles of its feet."

The face of the earth seems to have no charms for this timid little animal, with its coat of silky fur, like fine velvet, and shining black like the neck of the raven. Whether it be that its small eyes cannot bear the strong light, or that they are weak, and its vision thereby not sufficiently clear to appreciate the beauteous face of nature above and around it, but certain it is that its happiness is buried with it in the earth, and whenever it has been, in fox-hunting phrase, "unearthed," I have always seen it struggling with all its might to get back to the mine and the tunnel underground, ploughing in hot haste the dark and dull earth, that it might huddle down a path so murky that no eye could follow, neither could any unfriendly visitor intrude.

The character of the mole, like many other characters, admits of a good deal to be said on both sides; for the unintentional mischief done by the mole, especially in gardens, could never be tolerated. Garden walls, however deep and high, could never hinder the mole from entering, and he must be strangled if we would restrain him. A superstitious idea has gained ground among cultivators of the soil and others, that severe frosts during winter kill insects in the earth, and that heavy iron rollers crush wireworms. Now it is just possible that in the course of years some unfortunate wireworm might get badly bruised between the pieces of some hard clay clod crushed under the iron cylinder, and may have died of its wounds; but out of every thousand, 999 may be reckoned safe from harm in their usual winter quarters as regards frost, and, practically speaking, no amount of cultivation can touch the health of wireworms. But when we come to consult stern facts, we find that the mole is the natural enemy of the wireworm, and almost always in full cry after his prey; and when the dead mole is dissected, any one may satisfy himself that the chief food of the mole is the unresisting larvæ of insects, for the common earth-worm takes to the air at the approach of his underground enemy, the mole; and, as the wireworm takes years to come to maturity, we can easily comprehend that whatever other dainty fare the mole may meet with, it is clear that the *pièce de resistance* for the mole must be the standing ribs of the wireworm, for in the stomach of the strangled mole this *olla podrida* is seldom absent.

The wireworm in farming and in gardening is no contemptible enemy, and those who can cope with him, and give him battle on his own arena, should not be ruthlessly put *hors de combat*.

Considering the nature of the work that the mole is constantly engaged in, it is perfectly wonderful to see with what clean hands the mole comes out of his work, and how dry and silky his fur is, although it has slid through so many miles of earthy matter, more or less moist; and, if moralizing were my object, I should hint to the clay-besmeared clodhopper to consider how neatly moles do it underground.

The mole seems selfish and inveterate, as if it cared nothing for all the beauty of the earth and the music of the spheres, but grovels in the dark dull mould, as if it could not be charmed out of the grave-like pit where it buries itself. The mole is extremely quick in its sense of hearing, but, strange to say, it is for all that apparently dumb, for when it is chased and half-killed it never utters a sound.

A correspondent of the *Gardeners' Chronicle* stated lately that moles had been seen fighting above ground, and that the males often had a spar when they chanced to meet in the runs, and the editor waggishly headed the paragraph "The Mole in Love." With Homer's "Battle of the Frogs and Mice" before my eyes, I could not help picturing to myself a mole jilted, and the buxom "darkey" winking her small eye—where none could see—at her new beau; and the first love, whose affections had thus been trifled with, seeing—as none but moles could see, without light, and almost without eyes—the state of affairs, and firing at the sight, would no doubt give way to his enraged feelings, and drive the intruder from the burrow, and after wisping his earthy paws with a bit of dry sod, and wagging his stumpy tail in triumph, huddle down to his hole—the family seat—and after packing the passage firm with soil, to prevent intrusion, settle down with his partner, for a forenoon's nap and cool reflection.

Thirty years ago I communicated to the late Mr. Loudon a method of catching moles in the neck of a bottle. The system had been practised in Banffshire, and showed great shrewdness and powers of observation; for when a common wine-bottle had been broken, the funnel-shaped neck was fixed firmly by means of two pegs, facing the run; each trap requiring two bottle-necks to be complete—that is, one facing each way. When the mole comes to the smooth bore it gets the head through, and would get the body easily to follow, but the hind feet slip on the glass, and so without displacing any trigger, as in other traps, the mole is caught.

The usual trap of the professed mole-catcher is well known, consisting of a back-board, two bows, and a trigger, with nooses, worked by a bent rod of hazel. Sometimes we find a barrel-shaped wooden trap, turned in the lathe, with a place cut out for the trigger similar in every way to the last-mentioned, and worked like that with whipcord nooses, attached to a hazel spring rod. The crab's-claw trap is made of iron, like a large pincers, and is to be seen at the shops of most ironmongers.

In my own particular case, all these traps were inconvenient, and when a very little boy the task was set me to hunt this "*varmint*;" so I constructed a spring-trap, that had the advantage of occasionally catching two at one set; there is a cut of it in the later editions of *Loudon's Encyclopædia of Gardening;* it is constructed upon the plan of the common mouse-trap, with strong wire spiral springs put back to back; it fits into the run like a block, and is easily secured, and needs no covering over, and is not for field work, but is easily managed about a garden.

The heaps of fine soil in a grass meadow, loftily styled mole-HILLS, is no reason for destroying the moles that made them, but rather points to the lesser evil, the labour of dispersing each of them at a single stroke of the shovel, and even that little top-dressing is not without doing the farmer some service.

I do not wish to hide the faults of moles: I know them well, for the mole and I have been fellow-labourers these 40 years and more, one above ground and one below; but he has many excellent traits: quiet, cleanly, honest, active, and uncomplaining, he never intrudes into your privacy like the ravenous thieves of the mouse tribe. Upon the whole the farmer at all events may count him a friend; he has been so to many, and to all he might be recommended as one diligent in minding his own business and never meddling with affairs foreign to his *borough*.

ALEXANDER FORSYTH.

13, *Islington-square, Salford, Jan.* 24.

THE WHITE OR BARN OWL MORE USEFUL TO THE FARMER THAN A CAT.—Shortly before sunset the white owl leaves its retreat, skims along the hedge-rows, hunts over the meadows and corn fields like a spaniel, and drops suddenly on its quarry. You see her approach the homestead on noiseless wing, treading the labyrinth of stacks. She now enters the out-houses or the barn, and speedily reappears with a mouse in her claws. Perching on the top of a stack, she devours her prey, preens her feathers, and shrieks. Should plenty of food occur, she will remain all night and visit the place very frequently. It is at this time, especially if the weather be fine, that mice betake themselves to the outside of the stacks, where all night long they sport amongst the extremities of the sheaves, and doubtless drink the crystal dewdrops in their season. From her watch-tower this owl swoops down among them, or nimbly seizes them as she glides between the stacks. A sorry adept indeed she must be, if she do not secure one with each foot at a time. Nor must we forget the owl's services in the meadow and corn-field. With such facts before his eyes, where is the man who has the least interest in the cultivation of the soil that will not protect this beautiful and highly useful bird? In 1815 the late George Rennie, Esq., of Phantassie, in East Lothian, had the late Sir John Sinclair, Bart., staying a few days with him, whilst I was also a visitor in the house, and I shall never forget the very interesting discussion they had on the destruction of mice and young rats by the white owl. Like Mr. Waterton of Walton Hall, they had counted the number of these vermin which had been taken by a pair of white owls to their offspring during one night. Although I do not remember the number, yet I well recollect that it was enormous, and that they agreed to write to the late Mr. Curwen of Workington Hall, then M. P. for the county of Cumberland, asking him to unite with them in publishing the result of their determinations on this subject; and as these three gentlemen were the great agricultural luminaries at that day, such a document would have been likely to have had weighty influence throughout the United Kingdom.—*Chas. Waterton, his Home, Habits, and Handiwork.*

AGRICULTURAL GEOLOGY.

LIAS CLAY.

Lias clay forms the basis of the oolitic deposit of limestone, and lies on the variegated or second formation of sandstone. The word means, in the Anglo-Saxon language, *flames*, as the formation is often very bituminous, so as to induce the belief of coal; and the iron pyrite, which is very abundant by its decomposition and action on the argillaceous strata, produces an efflorescence of the aluminous sulphate so extensively wrought at Whitby. To the same cause must be ascribed the spontaneous inflammation often observed in the cliffs near Charmouth, Dorsetshire. Ansted gives the derivation from a repeated provincial corruption of the word "layers," in allusion to the laminar slices of the formation, both in a rocky and earthy condition. This clay is the shale of the lowest oolitic deposit of limestone, or the argillaceous accompaniment of every formation that has happened above the old red sandstone, which marks the transition from a crystallized condition to an earthy state of the composition of the globe. The lias constitutes the basis on which the whole oolite series reposes, and its specific gravity may have procured it the lower position of the deposit by the watery fluid. The clay is more than usually schistose in the structure, and calcareous matter in very minute particles is abundantly intermixed, so as to form thin beds of limestone, that are separated by narrow argillaceous partings. The quarries of the rock assume at a distance a striped and ribbon-like appearance. The limestone beds towards their centre, where most free from external mixture, contain more than 90 per cent. of carbonate of lime. The residuum has never been distinctly analyzed, but appears to consist of alumina and iron, and in some varieties traces of silver have been found. Towards the edges of the beds, however, when they come in contact with alternating strata of clay, the proportion of alumina is, as might be expected, more considerable. This limestone is particularly characterised by its dull earthy aspect and large conchoidal fractures. In colour it varies in different beds, from light shale blue or smoke grey to white; the former varieties usually constituting the upper, the latter the lower, portions of the formation. The blue lias, which contains much iron, affords a strong lime, distinguished by its property of setting under water. The white lias takes a high polish, and may readily be employed for the purposes of lithography. The slate clay with which the lias alternates is grey, brown, or black; is frequently bituminous, and readily divides into laminæ as thin as common pasteboard. The clays of the lias deposit are more or less laminated, and including in the lower parts layers and nodules of generally argillaceous limestone, and in the upper bands and strata ferruginous, calcareous, and arenaceous, which strongly resemble the bottom of the lower oolite formation. A partial graduated mixture has taken place during the deposition, and prepared by the sedimentary precipitation of the clay from the lime.

The lias is not rich in earthy or metallic minerals; layers and masses of jet are frequent in it, especially in the northern part of its course; and iron seems to be the only metallic substance, which occurs in layers, under the form of clay ironstone, or disseminated through the mass in the form of pyrites, but never constitutes a mineral vein. Galena and blende are said to occur in it near Bath and Whitby, and sulphate of barytes near Gloucester, and sulphate of strontium at Watchet. Chert is abundant, both in the lower and upper limestones; yet siliceous matter is rare in the formation of clay, though it is seen in South Wales, where the fossil, the gnyphus, is coated with chalcedony; but chert occurs in the lias of Watchet; and the lias contains veins of chert also near Cowbridge, in South Wales.

The organic remains contained in the lias are peculiarly interesting, and afford a rich field for observation. The animals of a higher order—the vertebral class—are in a greater number than is exhibited in the list of any other formation. Two very remarkable extinct genera of oviparous quadrupeds, evidently belonging to the same class with the great natural order lacerta, or lizards, are found in the argillaceous bed, and to which has been given the name of "marine lacerta." They appear to hold the same place with regard to recent lacertæ that the cetaceæ do to other mammalia, and form a division of the order lacerta. The investigation of their comparative anatomy has laid open many new and interesting links in the chain of animated nature, forming the connexion of the fishes and the mammalia, as being vertebrated and provided with legs, which latter appendages form a large step in the advance of creation. Bones and palate of the turtle have been found in this formation, and fish of several species also occur in its strata, but are of extinct genera. Leech-like teeth have been found, and also that of the shark. The existence of the crocodile is doubted, but is not improbable. Crabfish occur in one or two species. The testaceous mollusca are very numerous, both univalve and bivalve. The vegetable remains are of fossil wood, occasionally silicified, and several species of ferns and flags.

The lias formation has been designated as marking the reptile period of the globe, and forming a large advance in the scale of organized life. Though the genera are extinct, they are shown to have existed, and may have been somewhere preserved, to again appear in a somewhat altered form when the earth had undergone the prescribed revolutions to suit the changes of life.

The alum shale of Yorkshire belongs to the lias formation, which affords the manufactory of alum at Whitby; and bitumen appears so largely with the deposit as to have induced several trials for coal.

A general tendency to an argillaceous type belongs even to the limestones of the lias formation, and the clays exhibit a schistose structure that is not observed so much in the preceding geological formations. This circumstance shows the derivation of the deposit from the "shist" of the older formations, and that the changes of the materials had not been sufficient to remove the ancient structure. These peculiarities continue till the observation rises above the chalk, when solid layers of any kind wholly disappear, and the materials are blended in the most reduced form and irregular deposition.

The lias formation stretches across the breadth of England —from the coasts of the German Ocean in Yorkshire to those of the Channel in Dorsetshire. The northern limit commences in lining the coast and underlying the mountains of the eastern moorland, from the Peak alum works of Whitby to the Tees' mouth. Sand and sandstone compose the moorlands, and probably belong to the inferior oolite. Southward from the mouth of the Tees the lias ranges beneath the west escarpment of the eastern moorlands, passes York on the east, and crosses the Humber a little eastward of the junction of Trent and Ouse, stretching onwards beneath the scarp of the low oolite range of Lincolnshire to the Woldhills of Nottingham and Leicester and the celebrated quarries of Barton-upon-Soar, whence it continues, still regularly accompanying the scarp of the hills formed by the inferior and great oolites of Nottingham, Warwick, and Gloucester. The average breadth is about six miles, bounded on the south-east by the oolites, and on the north-west by the red marl. From within a few miles south of Gloucester the eastern limit still continues to accompany the oolitic ranges through Somersetshire to the coast of Dorsetshire, being its line of junction with the superior formations. Its western limit becomes very irregular, feathering in and out among the coal fields which occur towards the estuary of the severn and the upper part of the Bristol Channel, in Gloucestershire, Somersetshire, Monmouthshire, and Glamorganshire, and attended by numerous outlying masses. Leaving these intricate districts, the lias advances regularly to the south, and beneath the oolitic ranges through the south-east of Somersetshire into Dorsetshire, where the overlying strata of the green sand cover and conceal it, forming the high ranges of the Blackdown hills. The sands in this quarter extend successively over the edges of all the inferior strata as far as the red marl.

The lias is laid bare by denudation in all the eastern valley of the chain of sandhills, and may thus be traced to the coast of the Channel, where, in the neighbourhood of Lyme, it is displayed in a range of cliffs extending about four miles, and sinking at length beneath a covering of the inferior oolite and its sands. The stratum is best examined in the cliffs of Whitby, in Yorkshire; at Westbury, in the estuary of the Severn, in Gloucestershire; of Watchet, in Somersetshire; of Aberthaw, in Glamorganshire; and of Lyme, in Dorsetshire.

The lias deposit generally constitutes broad and level plains, at the foot of the oolitic chain of hills. Argillaceous formations mostly occur in low tracts, in the present configuration of the earth's surface, a circumstance which may be attributed to their having offered less resistance to the denuding causes which modified the inequalities of that surface, than to anything connected with their original formation. The lias is seen to occupy a considerable portion of the slope of the oolitic escarpment; and in the midland counties particularly, owing to the action of currents of water, detached portions of oolite are on the summits of many insulated masses of the upper lias shales. The plains of the lias are sometimes diversified with low ridges; and a slight escarpment may often be traced following the lower limit of the formation. This escarpment is most conspicuous on the borders of Nottinghamshire and Leicestershire, where it forms a well-marked range, distinguished by the name of the Woldhills. Near the Mendips the lias sometimes occurs on the brow of tolerably steep escarpments, but its maximum of elevation probably falls short of 500 feet above the level of the sea.

The thickness of the lias in the midland counties is taken as between 400 and 500 feet, from the joint consideration of the dip of the beds that constitute the formation of their horizontal extent, together with the relative levels of its superior and inferior limit. The inclination of the strata is very small, not exceeding 40 feet in the mile, and is in a south-easterly direction, conformably with all the strata ranging through the island from north-east to south-west; but it is occasionally much disturbed and affected by the ridges of mountain limestone and older rocks in Somersetshire and the county of Glamorgan. But such disturbances are always partial and limited, and the general character of horizontal stratification most generally prevails. Near Watchet these disturbances produce an appearance of alternation in the strata of lias and red-rock marl.

The water in springs is generally thrown out by the marl above the lias, near its junction with the lower beds of sand underlying the inferior oolites, and it is therefore doubtful to which of the formations they should with propriety be referred. Several mineral waters, as at Bath and Cheltenham, are thus situated. When completely within the district of the lias marls, water (excepting the ground spring) is only to be procured by sinking to the bottom beds.

The lias formation of clay exhibits a surface-ground of cultivation in Dorsetshire, commencing at Lyme Regis, and extending into Somersetshire by passing under the unconformable sands of Blackdown. Insulated masses of green sand frequently cover the lower oolite and lias, and render it difficult to trace the lines of junction or extent. In Somersetshire it surrounds the irregular elevations of carboniferous limestone, and advances regularly beneath the oolite range through the south-east part of the county, where it enters from Dorsetshire. The vale, or low ground, of Gloucestershire is formed by the lias-clay, and also the vale of Belvoir, in the county of Rutland, where the lias is separated from the great oolite by the red or reddish-brown ferruginous sands; and these are covered by vast accumulations of transported gravel near their junction with the lias, just on the western border of the county. The lias occupies the eastern side of the county of Leicester, and skirts the valley of the Soar, at the distance of two or three miles eastward from the river. The eastern and south-eastern border of the county of Nottingham is chiefly occupied by the lias, which is connected with Belvoir by the west of the river Smite. In Lincolnshire the strata of lias occupy the intervening valleys between Grantham and Newark. The eastern side is conterminous with the oolite formations, from beneath which the lias crops out. It pervades nearly all the western sides of the county, advances to Lincoln, and hence to the Humber, where it terminates in a space of two or three miles in width. In Yorkshire the lias forms the aluminous shales of Whitby, and also the lofty cliffs of Staithes, and supports the high moorlands of the carbonaceous sandstones and shales, and continues to the south, under the Wold-hills: not much surface-ground occurs for cultivation. In Warwickshire the formation of lias is large, extending over a great part of the county, from Aldminster to Upton and Stretton-on-Dunsmore, and forms a range of high ground from Bath-hill to Dunsmore-heath. The lias caps several hills to the north-west of the Avon, and between Stratford and Henley-in-Arden. The valley of the Stour, and the Vale of the Red Horse, are occupied by beds of the lias formation, and are well known in agricultural notice. In the county of Worcester the lias formation is found at Pershore and Evesham, and in the vales watered by the Avon: it extends from Fisher's Green to the limits of the county, near Tewkesbury. In the county of Glamorgan, in South Wales, the lias is extended in the formations among the dislocations of the old red sandstone, as on the opposite side of the Severn, among the coal-fields of Somerset and Gloucester. The vale of the river Ely, which is on the old red sandstone, divides a double chain of mountain limestone; and the valley exhibits several lower ranges, formed by up-fillings of the lias, commencing about five miles west of Llandaff, whence, with some interruptions, they accompany the Ely to its junction with the Channel near Penarth Point. It again appears in Barry Island, and continues to skirt the coast in a westerly direction for fifteen miles to the mouth of the Ogmore-river, forming a range of bold cliffs, among which is the little harbour of Aberthaw, celebrated for the lime it exports, which has the peculiar property of setting under water. These cliffs stand directly opposite those of Watchet, on the Somerset coast.

As the oolite rests upon the sandstone which overlies the coal, the lias, being the base of the formation, becomes very much entangled among the coal-basins of South Gloucester, and North Somerset, and in the Forest of Dean. The lias and the subjacent horizontal beds are seen filling-up near Bristol, and between that city and Bath, the interior of the basin that is formed by the strata of the encircling mountain-limestone and the old red sandstone, which are raised into bold and precipitous ranges of hills, among which the strata of the coal-measures are often highly inclined. Beyond the edge of the coal-basins the beds are seen at Pyrton and Aust Passages, and numerous other points along the estuary of the Severn, by which the first coal-fields are separated from those of the Forest of Dean. The interior of this coal-basin is throughout too elevated to admit any filling-up of lias; but that rock is to be found abutting in horizontal strata against the southern edge of its exterior ridges in Gloucestershire, near the mouth of the Wye, and in Monmouthshire, on the south-east of Newport; also at Godcliffe, on the Bristol Channel.

The lias formation of clay affords a soil that is well adapted for pasturage, in which state of use the greater part of that kind of land is retained. The natural herbage is not of the richest quality, and ranks much behind the clayey loams of Market Harborough and the alluvial tracts of Lincolnshire. But the pasturage is thought to tend much to the formation of curd; and the name of "cheesy ground" has got a currency in the language of the dairyman, as expressive of its value in that respect. The herbage tends to softness and flaccidity, suits pasturage rather than hay, and it wants the rigidity of the upland, as well as the luxuriant richness of the lowland qualities. The pasture is the first quality of the second grade of grass lands.

The occurrences are not many of the lias-clay in an arable condition; and the value of it in cultivation falls below the state of grass, as the best qualities of the ground are generally kept in pasture. The land can be ploughed by swing-ploughs of a strong construction, and best by three or four horses in the winter-furrow, and by two horses during the summer operations of the fallowing of the land, which is imperatively necessary to prepare the ground for future crops. Root-plants are wholly inadmissible. In most cases, but not in every instance, the land can be mown in the spring to admit some preparation for the crop of beans. The furrows are reversed: the soil is wrought by the alternate operations of the grubber lengthwise and across; and drills are formed in twenty-seven inches apart by a single furrow of the common plough. The beans are sown by machine or by hand; and the drills are harrowed to a level over the dung (if any) that was spread in the hollows of the ridglets. Horse-hoeing and hand-hoeing are thus most fully admitted. Where the texture of the soil does not admit the movement of the land in the spring, the surface is deeply and severally harrowed, across which ruts are made by ribbing-ploughs, in which the beans grow in drills that admit hand-hoeing and the work of a narrow horse-scarifier. Rotations of cropping are here given : First year, fallow ; second year, wheat or oats ; third year, clover ; fourth year, beans ; fifth year, wheat. Or : First year, fallow ; second year, oats ; third year, beans ; fourth year, wheat ; fifth year, clover ; sixth year, oats. In the pasturage fashion : First year, fallow ; second year, wheat ; third year, clover ; fourth year, pasture ; fifth year, oats ; sixth year, beans ; seventh year, wheat ; or, fifth, beans ; sixth, wheat.

Oats are not profitable on meagre clays. The plant requires a strong loamy adhesiveness, attended with a large openness of texture. The crop is often inserted for sake of variation. Peas are excluded by the strong clamminess of the soil ; and a failure of the crop renders the land very foul with weeds—almost beyond redemption.

The quantity of lime applied to an acre of the fallow-land should not be under two hundred bushels, and used along with farmyard dung, which is the sole manure that the soil permits to impart any benefit. The draining may be in the frequency of five yards ; the cavities dug and filled as with other clays.

The grass seeds to be sown for pasture are as under, per acre : Ray-grass, ½ bushel ; cocksfoot, ¼ bushel ; meadow fescue grass, 4lbs. ; meadow catstail, 4lbs. ; dogstail grass, 4lbs. ; red clover, 6 or 8lbs. ; white clover, 4lbs. These seeds, being very intimately mixed, must be sown by a broadcast machine on a finely-harrowed surface of ground, that is again harrowed to cover the seeds, and finished by a heavy rolling.

The lias-clay is best seen in the true existence in the country between Bath and Bristol, where it is found in narrow valleys, and not very wide extents of cut ground, and is very much interlaced among the disturbances of the underlying coal formations, and the surrounding ranges of the carboniferous limestone and old red sandstone. The clayey strata constitute the "fillings-up" of the Wernerians, by which the hollows, occasioned by the irregular eminences and angular elevations of the rocky strata, have been filled, and comparatively reduced to a level, by means of an earthy shale that has been reduced by an aqueous agency to a state of decomposed and plastic materials. In that locality the rock of the lower oolite is well exhibited in the sandstone of Bath, which rests upon the lias, and supports the upper deposit of the same formation. The northern direction of the oolite series of strata exhibits, through the whole course, a regular tendency to modifications and alterations of the attending argillaceous deposit. The quality of the clay is better in the midland counties, and in Yorkshire, where the formation terminates : the nature is wholly changed into an aluminous shale. The gault is similarly changed from the type of Surrey, on the red sands of Reigate and Bletchingly, where it is found at the bottom of the chalk-hills of Cambridge and Huntingdon. The denudations have been dissimilar, and the subsequent inundatious have effected different purposes. The London clay varies when placed beyond the basin of the metropolis ; and the plastic formation loses the primitive quality beyond the chalk range of the northern Downs. Each formation enjoys the choice locality of its inherent type ; and, beyond it, a variety of causes has concurred to change the nature, and, at last, annihilate the existence. This fact attends the particular consideration of every cultivable stratum of Britain.

CLUNCH CLAY.

Clunch clay occupies the moist valleys of the middle deposition of the oolitic rocks. That vast argillo-arenaceo-calcareous mass is divided into three systems—the lower, middle, and upper—and each is attended by concomitant beds of argillo-calcareous and calcareo-siliceous deposits, which divide the systems by their intermediate positions ; and all the formations have characteristic local distinctions in their organic remains. The low vales occupied by the clays, which intervene between the rocks of the several deposits, have undoubtedly been caused, at least in part, by the corrosive action of water. But to whatever extent this principle is applied in explaining the present inequality of the earth's surface, and whatever aid is received for the established data of local elevation, these limited agencies always leave unexplained the general fact, viz., the regular altitude of continuous ranges of hills, with uniformly declining plains, and no particular marks of convulsion, which overlook extensive undisturbed plains of older strata.

The clunch clay derives the name from the "clunches," or indurated lumps of clay, which are found in the beds of the argillaceous mass, and which, being frequently bituminous, resemble the lumps which miners find next the coal, and have named by the above term. The formation is very deep, of a tenacious and adhesive clay, of a dark blue colour, becoming brown on exposure, and containing argillo-calcareous geodes and septaria, and some layers of a chocolate-coloured shale. The septaria, from an obvious analogy, are frequently termed turtle-stones ; and the geodes are employed as coarse marble. The argillaceous strata are frequently mixed with calcareous, and sometimes with bituminous matter, affording in the latter case an inflammable shale, which in variations constitutes the origin of the clay. The lower part of the formation occasionally contains irregular beds of limestone, which from their partial occurrence can only be considered as subordinate to it. These have been noticed at Kelloway Bridge, near Chippenham, Wiltshire, and hence have been called the Kelloway rock. This stone occurs in irregular concretions, the exterior aspect of which is brown and sandy, the interior being harder, and of a bluish colour. It consists almost entirely of a congeries of organic remains, among which several varieties of ammonites are predominant. The beds of clay which immediately cover this rock abound in selenite ; and below it are found a brown aluminous earth and bituminous wood. Beds of clay separate the Kelloway rock from the oolites of the next division. In Yorkshire, the clay is less tough, and more generally laminated, gradually changing in quality to the Kelloway rock below, and the calcareous grit above. The limestone is only used for mending the roads ; and as there are very few excavations for this purpose, it is difficult to trace its course—in Wiltshire chiefly, and at one place in Somersetshire.

Iron pyrites and selenite occur abundantly in this clay, as in all argillaceous formations. The association of sulphur with the clay-strata leads to the inquiry of mineral waters being derived from the beds immediately contiguous to the Kelloway rock.

The organic remains differ from the lias in the bones of oviparous quadrupeds : they are rare, and show an entirely different species. The shells are both univalve and bivalve —chambered, and not chambered. The limestone is distinguished by peculiar bivalves, which do not occur in the clay.

The depth of the clunch clay is ascertained to reach seven hundred feet in the midland counties, and cannot be much less in the south-western. The general dip of the formation appears to be to the east and south-east, under an angle scarcely, if at all, exceeding one degree, except in the elevated track north of Weymouth, where the direction and dip change, and the angle is often as high as thirty degrees.

Water is found by sinking through the whole formation. The work is laborious, and often unsuccessful. Mineral springs occur in the course of the formation of the clay ; but perhaps their true seat is the upper bed of the subjacent oolites. The stratum is, for the most part, extremely low, and the eminences are nowhere considerable. Valleys contain the greater part of the deposit.

The uncertainty which yet prevails concerning the true divisions of the oolitic formations which appear in Yorkshire prevents absolute decision concerning the course of this formation at the north-eastern termination of the diagonal zone, which it forms across the country. It seems certain, however, that the clay occurs on the coast of that county, near Filey Bridge, underlying the calcareous grit of the coral-rag formation ; and it probably forms the greater part of the vale lying along the Yorkshire Derwent, as far as New Malton, and intervening between the chalk and oolite hills. On the coast of New Malton, the chalk advances close to the oolite hills, and overlies the argillaceous tract.

South of the Humber, the clunch clay is traced in a southern direction through Lincolnshire, following the course of the Axeholme navigation and the Witham river to Boston. The formation is very narrow in the north, becomes wider as it proceeds southward, until it disappears beneath the vast alluvium of the fens. It forms the substratum of the western portion of the Cambridgeshire fens, and those which border on Huntingdonshire ; and hence it has been called "fen clay." Its breadth near the Humber is three miles ; east of Lincoln, about fifteen miles; and between Sleaford and Spilsby, twenty-five miles; but in this part it is partially covered by the marshes of the Witham. It occupies the valley of the Ouse through Bedfordshire, and a large extent in the county of Huntingdon, which forms the separation between the middle and lower assemblage of oolites. The position is nearly horizontal, and the depth has been ascertained in five hundred to seven hundred feet. From Bedford to Oxford, the breadth is about five or six miles, and often less. West of Oxford, it occupies the valley of the Isis as far as Cricklade, crops out from beneath the coral rag, and occupies the middle part of the county as far as Bicester, Woodstock, Witney, and Bampton, near which towns the line of junction between this and the subjacent formations may be traced. From this large extent, the argillaceous deposit has been called "Oxford clay," and the tract of country is for the most part low and flat. In Buckinghamshire the clunch clay rises from under the Aylesbury limestone, and extends to the town of Buckingham, and to the north-west of Stony Stratford and Newport Pagnell. From Cricklade the clay bends to the east of Malmesbury, traverses Wilts in a south direction, following the course of the Avon past Chippenham to Melksham, having a breadth of five to eight miles, and being always bounded by the escarpment of the coral rag on the south and east, and by the rise of the hills formed by the subjacent oolites on the north and west. From Melksham its course continues south, through Somersetshire and Dorsetshire, passing by Wincanton and Sturminster, on the south of which it is overlaid by the great western extension of the chalk and green sand. In this part of its course it is not more than three miles across, and has always the subjacent oolites on the west, and the coral rag escarpment on the east, except near Wincanton, where the green sand advances upon this formation.

The formation reappears in the south of Dorsetshire in the Weymouth denudation, where its course is sufficiently indicated by that of the coral rag, since it occurs interposed between the central nucleus of the subjacent oolites and the collateral chains of that rock.

The chief development of the clunch clay is in Oxfordshire and in the county of Lincoln, where, with some few other localities, the surface ground is reduced to arable purposes. The general character is a cold and intractable clay, not so favourable to grass as the lias formation, and little or no better in the quality for the production of crops. It exhibits more proofs of the indurated shale of the "schist" which forms the type of the argillaceous deposits, and the composition is less bituminous and coaly as being a step further removed from the carboniferous formations. The texture excludes green crops, and is not favourable to the proper cultivation of beans. But in many cases, or mostly in all, the land can be stirred in the spring in preparation for the crop of beans, which are sown in drills of 27 inches apart to admit the horse-hoe. The work is done by the grubber lengthwise and crosswise after one ploughing from the winter furrow, when the drills are opened by the common plough, the dung deposited, the seeds sown, and the drills reversed by the same implements. When the adhesive quality of the soil does not admit any movement of the land in the spring, the surface is deeply and severely harrowed across the winter ploughing, on which ruts are made by one-horse ploughs to receive the seeds, or the beans are deposited by the drill machines that are provided with long coulters, which make ruts in the ground, and the work is covered by a bush-harrow. Where the land is of good quality, and free from weeds, the dung may be laid on the stubble in the late autumn or early winter, and ploughed into the ground by the winter furrow. The surface is harrowed in the spring, and drilled across as before directed.

The rotations will be best in cropping as under (with dung and lime) :—1st year, fallow; 2nd, wheat; 3rd, beans; 4th, oats or wheat; 5th, clover; 6th, oats. And (with dung or lime) :—1st year, fallow; 2nd, wheat; 3rd, clover; 4th, oats; 5th, beans; 6th, wheat. Or :—1st year, fallow; 2nd, oats; 3rd, beans; 4th, wheat; 5th, clover; 6th, oats. The pasturage system will be :—1st year, fallow; 2nd, wheat; 3rd, clover; 4th, pasture; 5th, oats; 6th, beans; 7th, wheat.

Farmyard dung is the only manure that can be used except the pulverised top-dressings on the spring crops, and the quantity of lime applied on the bare fallow should not be under 150 bushels an acre, and done in every third return of the rotation. The draining to be performed in the frequency of five or six yards between the cavities, and placed and filled as before. The seeds of grasses to be sown for pasture are as follows:—Ray grass, $\frac{1}{2}$ bushel; cocksfoot, $\frac{1}{4}$ bushel; meadow fescue, 4lbs.; catstail, 4lbs.; dogstail, 4lbs.; red clover, 8lbs.; white clover, 4lbs.

Clay lands must be ploughed in November or December, with a furrow of seven or eight inches in depth, and five or six inches in width. The subsequent ploughings may be done by two horses, and the furrows must be narrow, so that no land remains unmoved. A strong close-tined grubber may be very beneficially introduced in one or two operations during the latter workings of the land—the soil will be loosened that may adhere in the plough furrow, and the texture will be rendered more porous.

For this purpose being completed, two grubbings are required singly in the longitudinal and cross directions, by which both the ploughing and harrowing of the ground are very much assisted. The due and careful performance of the process of fallowing lays the foundation of the value of every crop in the rotation. The wheat rests on the depth of cultivation, the clover depends on the pulverisation of the surface and the oats on the incipient adhesion of the mowed and sliced soil. The value of a pure clunch clay soil is hardly a medium, or about 16s. per acre. The loamy modifications are more.

RESULTS OF APPLYING ASHES ON GRASS.—

Messrs. Editors—In the fall of 1863 I had an acre of old grass land that had become so run out it did not produce half a ton of hay, ploughed about 7 inches deep, turning the furrow over flat, so as to completely invert the sod. The next spring, 1864, there was hauled on and spread from the cart 75 bushels of what I then considered very poor ashes, as they were made from various kinds of wood, but mostly old worn out chestnut railroad sleepers, burned in the furnace of a stationary steam engine; they were also full of small coal, which had fallen through the furnace grate into the ashpit, where it was extinguished by water leaking from the boiler. The ashes were well harrowed in, and the ground then sowed with 3 bushels of oats, 1 bushel of red top, half a bushel of herds grass, and 10 pounds of clover seed. The oats were harrowed in and the seeds rolled in. The summer of 1865, as is well known, was very dry, there being the most severe drought between the first of June and the first of August ever known in this vicinity. The oat crop in general was a very poor one; I do not think the yield was one quarter of an average crop in this town. This yield of oats was, however, a remarkably good one, the straw was so tall and heavy loaded with oats it lodged down in many places. It was noticed by farmers who could hardly believe there was nothing but ashes put on the land. The produce was over 30 bushels of good heavy oats, which sold quick at 1 dol. per bushel; but oats were scarce, even at that price, at that time, owing mostly to the failure of the crop throughout the State. The grass and clover seeds caught well and grew well. The next year, 1865, I cut between two and three tons of good hay, principally clover. The second crop of clover would have made another ton, but not having time to cut it I fed it off with cattle. The last winter was a hard one for clover, so it was pretty generally killed out in this vicinity. On this field it was all killed, except a little on a side hill. But the herds grass and red top grew very stout, so it yielded about two tons of hay, of first quality, this year. The field was noticed as one of the best fields of grass this year, as it was one of the best fields of oats in the year 1864. For many years before the ashes were put on, it was noticed as the poorest field of grass in the neighbourhood. It seems to me this three-quarters of a cord of poor ashes, the purchase, carting and spreading of which cost me about as much as it would to have purchased, hauled, and spread two cords of stable manure, has produced remarkable results. Judging from my own experience in farming, I think six cords of manure would not have produced more oats and hay thus far. Whether the ashes will hold out as long as manure would, remains to be seen.—A. C., *in New Hampshire Concord (U.S.)*

MILLS AND MILLING.

8.—DRESSING MILL-STONES.

Much has been said and written about dressing mill-stones The usual plan of laying out the "lands and furrows" will be found illustrated in the advertisements of Bryan, Corcoran and Co., W. R. Dell, and J. Hughes and Sons in the advertising columns of the *Mark Lane Express*. The latter firm also give drawings of the implements used in dressing, including "brass-sheave blocks for raising the mill-stones," "stone staff," "prover," "mill-bills," and "mill-bill handle." But from this common plan of dressing and the mill tools in use there are many exceptions, and these are every day increasing in number. Of late the go-a-head proposition of the pioneers of progress is to do the work of dressing in all sorts of ways by means of machinery, to a nicety far surpassing anything ever attained by manual labour—so at least they presume in their specifications.

The ancient Chaldeans, Egyptians, Phœnicians, Hebrews, Greeks, and Romans excelled in the art of stone dressing; and there is no doubt but the dressing of the mill-stones then in use was a question of some considerable importance, although history is silent as to the peculiarity of the practical solution which the question received. But the probability is that the two plans of simply roughing and furrowing which have come down to the present day were in use at a very early period in the history of milling. In Pliny's time these two plans (roughing and furrowing) were in use both in the dressing of millstones and mortars, the pestles of the latter commonly in use in South Italy being only roughed; while those of Etruria, or modern Tuscany, were shod with iron teeth or cutting edges radiating from the centre in a star-like form—analagous in principle to the furrows of the mill-stone. At this time the Romans were in possession of the extensive lava quarries of the Rhine (still worked), the stones of which are capable of being dressed in the highest degree of workmanship to any design and form of grinding surface according to either plan. There was thus no obstacle in the way of progress in the art of dressing. Hence, the conclusion that the high attainments made were probably of a very early date. In point of fact the ancient Etrurians rank with the Chaldeans, Hebrews, and Phœnicians, both as to language and art, and history expressly affirms that mills were introduced by them into Italy, and that from them the Romans derived most of their useful arts.

In roughening, as well as in furrowing, it is common to set out the face of the stones in sections, technically termed "quartering," and then to work to some given definite rule. It is not a branch of the art which anybody can perform, but the contrary, the manipulation being a very nice one, requiring both skill and experience to master it. The more common plan in this country is furrowing, as represented in the illustrations above referred to in the advertising columns of the paper; but at the present time, if we are to judge from numerous propositions recently patented, several of which have been introduced from France, a combination of the two plans (roughening and furrowing) is better than either alone, because the grinding surfaces thus dressed are capable of doing more work, while they, at the same time, are less liable to heat and injure the flour. And this too is a very old theory, as the sequel will show.

Into the question of heating from friction of grinding surfaces and the reduction of the grain into flour we do not enter at present; but the best form of grinding surface is one involved in the dressing; and, as formerly stated, the form of the face of the stones and the roughening and furrowing are practical questions inseparably connected together. In illustration of this, we on a former occasion referred to the Tuscan or Etrurian method of dressing stones and pestles, promising to return to the subject, so as to bring up its details. We shall now fulfill that promise.

The writer of the article "Mills and Millstones," in "Partington's Cyclopedia of Arts and Sciences," says: "The millstones employed in Tuscany differ from those used in this country; indeed, on account of their great superiority of form, it may be advisable to describe them somewhat in detail. The size of the mill-stones used for the most powerful mills, as well as for those of inferior strength, is a circle of four feet —the size of the eye is about seven inches. The face of the upper stone is hollowed to a conical surface, the depth or height being about one inch and a-half. The face of the lower stone is convex; the surface is nearly the portion of a sphere, having a radius of thirty feet, so that a distance of about one inch is left between the centre of the two faces. A deep socket is let into the upper stone or runner, for the reception of the iron nut placed on the square of the spindle. The runner is balanced and rendered parallel to the convex or bedstone by means of four small wooden wedges, two on each side, between the nut and the socket.

"They (Tuscan millers) profess to cut the teeth in the form of a hyperbolic spiral, being cut without any great regard to mathematical precision, they are usually portions of circles, the place of whose centres is in the circumference of a circle of fourteen inches radius described from the centre of the stone. In general the teeth are as close as possible to each other, but near the eye they are fewer, deeper, and coarser."

The tool employed to cut the teeth is a double-edge hammer, four inches wide, very sharp, and weighing about twelve pounds. When the stones are new from the quarry a few days are sufficient for this operation; and when they have been already in use, any able miller's man will complete it in twenty minutes. The real grinding surface is the six or eight inches next the circumference of the stone.

Practically speaking, there is much room left to fill in working details in order to reconcile this description of the Tuscan mode of dressing mill-stones to any definite mechanical rule, while the twenty minutes allowed for a second dressing won't read at all. At the same time, it must be admitted, as containing a general outline of the facts of the case. That part of the description more difficult of solution is to find the dimensions and curvature of the circular-teeth or furrows said to be described from centres in the circumference of a circle of fourteen inches radius from the centre, and hence ten inches from the circumference, the diameter of the stone being four feet. And what renders it all the more so, is the fact that near the eye "the teeth are said to be fewer, deeper, and coarser," the contrary being the mechanical conclusion from the literal reading of the description. It does not, therefore, need much reflection to perceive that the description requires to be filled up in its practical details, for it simply takes certain things for granted necessary to make a complete whole.

As this forms an interesting problem to millers as well as to the march of progress, let us have recourse to a geometrical illustration which any of our readers may make who has a compass and a sheet of paper. Thus from a common centre describe three circles—the first, with a radius of three-and-a-half inches to represent the eye of the stone; the second circle, with a radius of fourteen inches to represent the line of centres in setting out the "master furrows;" and the third circle, with a radius of two feet to represent the circumference of the stone, the three circles being drawn to any convenient reduced scale as one-fourth or one-eighth the natural size. In Bryan, Corcoran, and Co.'s wood-cut there are nine master furrows or quarters; in Dell's, twelve; and in Hughes and Sons, fourteen. But for the Tuscan plan we aver the former of these would be too many. This, however, we leave to the judgment of our milling readers. The easiest subdivision of the circle is that of radius, *i. e.*, fourteen inches, which would give six master furrows or quarters, and with the same radius fourteen inches from the six centres in the circumference of the middle circle the six master furrows may be set out. Thus subdividing the eye and circumference, also each into six equal parts or segments.

Thus for the work of constructive geometry in setting out the master furrows is simple, but when we begin to fill up the lands or "quarters" between them with furrows as close as possible to each other towards the circumference, but fewer, deeper, and coarser towards the eye, we must of necessity throw our compass aside, and adopt some of the more complicated mathematical instruments for drawing the hyperbolic spiral, or work by some thumb-rule approximation to it, and this latter is, no doubt, what the millers of Tuscany aim at attaining, for the eye of a skilful workman will approximate very closely any curved line which experience may lay down as a pattern. In point of fact, the master furrows being laid down and cut deeper and wider towards the eye, and diminishing in depth and width towards the circumference form a rule and pattern to the filling up of the lands between; for the outer-zone beyond the middle circle or line of centres would in principle be a roughened surface, the teeth between the furrows being less or more broken from being worked as close to each other as possible, whereas on the inner zone towards the eye they would be more complete, while the curve lines which the edge of the teeth and the bottoms of the furrows form would be a departure from the circle, and an approximation to some other section of the cone not parallel to the base, or perhaps we may rather say cutting the base, thus forming either the parabola or hyperbola, the latter being the curve in the estimation of the Tuscan miller, although the former is as likely to be the true curve, it being much more common, and attainable.

It will thus be perceived by those acquainted with mill stones that the species of curved line formed by the teeth of the Tuscan millstone, and also by the master furrows, will depend much upon the curved form of the face of the stones; so that there will be a difference between those of the bedstone and those of the runner, and also between the curved lines formed by the edge of the teeth and those formed by the bottoms of the furrows, assuming that both are worked to an angle.

The difference between the millstone dress in Tuscany and that in this country will also be seen to be considerable, and consequently their action in the manufacture of flour. In the case of the latter (our stones), the edge of the furrows of the opposite stones, in passing each other, have a clipping action; while the surface of the lands between, grind and bruise. In the case of the former (the Tuscan stones), the action of the deep coarse teeth towards the eye would decorticate and shell the grain; while, towards the circumference, the action of the fine teeth would grind, so that the process from shelling to grinding would be gradual, the result being a better separation of the bran, with a finer quality of flour, than is produced by the English plan, in which much bran is cut up into dust and mixed with the flour, giving it a darker colour than it would have if manufactured by stones dressed after the Tuscan fashion, or when first shelled and then ground on the old plan. Such are the practical conclusions of the millers of Tuscany—conclusions which appear to rest upon a solid foundation of physical data.

From a progressive point of view, there is something very interesting and instructive in the Tuscan or Etrurian plan of dressing millstones, in order to produce the finest possible quality of flour. In the first place, for example, it certainly shows that the millers of that country had reached a very high degree of attainment in the art of milling at a very early date. Pliny, in his time, acknowledges this; so do Virgil, Vitruvius, and other Roman authors. And in the second place, it reads our modern pioneers of progress a timely lesson of caution; for little short of half the number of patents now being applied for is for improvements in mills for decorticating and shelling wheat as a preparatory process to grinding, so as to separate the bran more effectually, and thus produce a finer sample of flour, and for dressing the stones on the principle thus practised by the Etrurians in Tuscany, for the same purpose, and also to obviate or reduce the heating of the stones from friction to a less destructive degree than is experienced by English millers from the common furrow and land style of dressing already referred to.

A sectional drawing of a pair of millstones, in working order according to the above data, will show that both the grinding surfaces must be generated by two curve lines, and that both these were probably conic sections, the two sections being so made as to leave nearly an inch between them at the eye, where the grain enters. In the time of Pliny, the Tuscans were perhaps better versed in mathematics and stone-cutting than they are at the present day; and as the mill-staff can as easily be set to one curve as another, and the face of the stone worked to the same, there is no valid reason for assuming an unfavourable opinion of the art to the contrary. At all events, long before our time, the millers of Tuscany thus manufactured and dressed their millstones; so that the principle upon which the plan is based is now public property, and therefore cannot be claimed in any patent.

The *rationale* of this style of dressing has reference, not only to the reduction of the grain to flour, but also to the working of the grain and flour onwards to the circumference by the centrifugal and fanning action of the runner, and the joint co-operation of the bedstone thereto, together with the keeping of the stones and flour as cool as possible, so as not to destroy or injure the natural odorous and sapid properties of the latter —the flour. The grinding surfaces may thus be said to have a fourfold function to perform, viz. (1) shelling, (2) grinding, (3) centrifugal action, and (4) fanning action; and, in dressing, these must all be duly attended to, as will be shown more in detail under the respective claims which they fall, as "progressive grinding," "aërating the stones," &c. If the face of the stones is too flat, for example, all these functions will be less or more sacrificed; if too elevated at the eye, the centrifugal and fanning action will be directed too much against the surface of the bedstone, so that a similar result will be experienced; if dressed uniformly throughout, from the eye to the circumference, the first will be interfered with, and the second also—the latter two will therefore be less or more impaired as a consequence; and if the stones are too close, or too far apart at the eye where the grain enters, the result will be hardly less favourable. In ploughing land, straight furrows form the rule; but, in dressing millstones, the application of this rule is very problematical; while the face of millstones generated by straight lines is opposed to sound practice: hence the curvilinear theory of dressing mill stones vertically and horizontally.

9.—PROGRESSIVE GRINDING.

Machines for removing sand, smut, and other refuse matter from grain will be noticed under a different sub-heading—viz., 21. But shealing and decorticating mills will be included in this paper, along with grinding mills in which the grain is passed through between two or more pairs of stones, the latter being set closer than the former—a process which has technically been termed "progressive grinding." Thus the grain may, in passing between the first pair of stones, be hulled, shealed, or decorticated; between the second pair, it may be ground into coarse meal; and between the third pair, into fine flour. The object of these consecutive steps is two-fold—first, to separate more effectually the bran, so as to make a whiter sample of flour; and second, to obviate heating, so as to preserve the natural aroma, or odorous and sapid properties of the grain in a normal state, and also to prevent other injuries which heating always, less or more, produces.

From time immemorial, two plans of decorticating, or of removing the husk from grain of every kind, have been in use, viz., moist-shealing and dry-shealing. The former of these methods has already been referred to in No. III. It may, we presume, to this day be seen in operation in the north of Scotland in making pot-barley, by moistening the barley in a mortar, and then working-off the husks by means of a pestle or mallet-pestle. Until pot-barley mills were introduced from Holland, about the commencement of the last century, all the barley thus used in the north was decorticated by the pestle and mortar. But when to be ground into meal or flour, the grain is shealed between millstones set wider than for grinding.

From the peculiar turn the progress of manufacturing flour is now taking, it will be necessary to go somewhat more into details in the former class of mills than would otherwise have been necessary. Thus, of late, the more effectual separation of the bran from the flour has been proposed, by removing it from the wheat before grinding, which is done by moistening it with water and certain acids. Numerous projects of this kind have been patented under several processes, the patentees belonging chiefly to foreign countries, where the manufacture of flour has always been in an advanced state. Another line of progression consists in improved machinery for hulling and decorticating grain in a dry state. Since 1852, when the new patent-laws came into force, more applications for patents have been made under this branch of milling than under any other. In the specifications of these new projects, the importance of this old practice is clearly set forth, along with the shortcomings of cutting up the bran and grinding it into dust, thereby discolouring and depreciating the market value of the flour.

A third line of modern progression in the milling and flour trade is the baking of the flour in ovens raised to a torrifying heat, in order to produce certain chemical changes considered favourable to its dietary use, or the torrifying the grain before grinding.

To each of these lines of progression we shall find very close parallels in the milling practices of ancient times. To the latter—the baking of flour and wheat in ovens—the parched corn of the Hebrews may be quoted as an example. Thus Boaz gave Ruth parched corn; and Jesse sent David with an ephah of parched corn to his three sons in the army of Saul. The practice, it must be borne in mind, is distinct from kiln-drying, or drying by fire; for the corn in moist latitudes was first kilndried, and then parched; and both these were in use amongst the Hebrews in the time of Moses and Joshua, both in Egypt and Canaan. This is evident from the Levitical law relative to the offering of the first fruits (Lev. ii. 14). From the cradle of our race, the practice was carried into every country in Europe. Throughout the British Isles it was at one time universal. Up to A.D. 1284, it was common in Scotland; but in that year it was statutorily ordained by Alexander III. that "Na man sall presume to grind quheit, maishlock, or rye, with hand mylnes, except he be compelled by storm, or be in lack of mills quhilk sould grind the samen. And in this case, gif a man grindes at hand-mylnes, he sall gif the threttein measure as muhter; and gif anie man contraveines this our prohibition, he sall tine his hand-mylnes perpetuallie." After this, landowners not only bound their tenants to grind at their grist-mills, but also empowered their millers to search out and break all the querns they could find. Hence the reason why so few querns are now to be found; and along with the practice of grinding at home, the copractice of parching or graddening corn was given up. But Pennant, in his "Tour in Scotland," in 1760, found in two of the Western Isles, Rum and Sky, both practices in full operation. In plate 34, he gives a drawing of two "island lasses" grinding at the quern, and singing merrily as they ground their graddened corn. The following is his description of the process of parching corn in the Hebrides:—

"Notwithstanding this island (Rum) has several streams, here is not a single mill. All the molinary operations are done at home. The corn is graddened, or burned out of the ear, instead of being thrashed. This is performed in two ways—first, by cutting off the ears, and drying them in a kiln, then setting fire to them on the floor, and picking out the grains, by this operation rendered as black as coal. The other method is more expeditious; for the whole sheaf is burnt, without the trouble of cutting off the ears……I must observe that the island lasses are as merry at the work of grinding the gradden—the καχρος of the ancients—as those of Greece were, in the days of Aristophanes,

"'Who warbled as they ground their parchèd corn.'
'*Nubes*,' act v., scene 2."

Into Italy the practice of parching corn was introduced, or rather carried, by the Etrurians, who were coeval with the Hebrews and Phœnicians, and from whom the Roman colonies borrowed most of their agricultural improvements. They (the ancient Etrurians) made great progress in the arts at a very early period in the history of Italy; and Pliny quotes them as the highest authority, in his time, in the art of milling; and we may add, it is specially recorded that mills were introduced into the Roman states from Etruria (see article "Etruria," in "Rees' Cyclopædia," and authorities there cited).

We have already quoted Pliny's very general and somewhat imperfect description of the Etrurian pestle and mortar used in shealing or decorticating moist grain, when worked vertically; but, from mills found in the ruins of Pompeii, it is manifest that very great improvements were made upon the original. Such being the case, it will be necessary to follow up the consecutive steps in the march of improvement, in order to perceive the demands of the dietary of the Romans, which before Pliny's time was proverbial for its refined extravagance.

Pliny's imperfect description of the mode of grinding corn in his time has given rise to much unnecessary controversy, from inattention to the demands of the Roman market, and the mills of Vitruvius, at work long before he wrote his Natural History. Long, too, before this time, the Romans chiefly used the black-lava millstones of the Rhine—millstones which were also used throughout the most of Germany. The Vitruvian runner, therefore, was not the inverted mortar of the Etrurians, as many speculative writers have supposed, but an enlarged copy of the common hand-mill, or Hebrew chariot, first brought into Italy by the Etrurians from Asia, enlarged so as to meet the power of animals and of water. It is now generally agreed that the mills alluded to by Pliny were exclusively for shealing and decorticating, and not for grinding, and that the Vitruvian water-mills were then common. It was an exception to this rule that he refers to—the Etruscans continuing the practice of husking or shealing spelt wheat, then chiefly grown in Italy, by the old process of parching or burning the grains out of the ear, as they did in Rum and Skye, down to the middle of last century. The Romans always, we may observe, kept a large stock of corn in granary. It was found to keep best in the ear: consequently, it was thus harvested, carried home in baskets direct to the granary or barn; and, when to be ground into flour, the ears were thrown upon the floor, and the wheat burnt out and parched, ready for grinding; but, by Pliny's time, the black, coarse flour of parched corn did not go down with the extravagant refinement of the Roman taste; for, as the demand of the British capital now is, so it then ruled the markets of Rome, for nothing but the finest white flour would pay the miller and the merchant. This refinement in the Roman taste gave rise to a corresponding improvement in the construction of mills, more especially for separating spelt wheat from the ear and husk, and for the removal of the bran and husks of the various kinds of grain then ground into meal or flour.

The writer of the article "History of Corn and Flour Mills" in the *Encyclopedia Metropolitana*, Vol. viii., p. 361, says: "Both mortars and pestles were at first made of wood, no doubt the hardest and most compact that could be found. This material was afterwards superseded by stone, and the Etrurians seem to have given the mortar a deeper and more cylindrical form than usual; they likewise furrowed the sides with longitudinal scores, and cut the bottom in rays like a star. That part of the pestle which entered the mortar was rough, and was terminated by an iron spike, intended probably to be placed in a hole in the centre of the star just mentioned. The pestle was worked in an upright position, and seemingly by a rotary movement on its axis. This mortar, or mill, as it might without much impropriety be called, was intended, however, only to husk the grain—not to reduce it to powder. If the corn-mills generally used in Italy in the latter times of the Roman Republic, and during the reign of the first emperors, were of the same form as those which have been found at Pompeii, it is evident that the Italian corn-mill differed entirely from that used in Greece and in Asia, being in principle nothing more than the Etrurian mill reversed. It consists of a stone post (the pestle) fixed in the ground and terminated by a cone, having its point cut off; a hollow cone (the mortar), also with its point cut off, is laid upon the solid one, and the sides of the former being somewhat less sloped than those of the latter, it is manifest that they will touch only by their lower edge, and from that part will diverge upwards, leaving an angular space between them, the width of which will be regulated by the difference of slope in the exterior and interior cones—this space will be grinding surface. To the upper part of the outer cone is fixed a funnel-shaped hopper, and two opposite horizontal beams also project from it, to which are attached the animals by whose strength the mill is turned. The corn being delivered from the hopper into the space between the two cones is there ground by the rotation of the outer one, and the meal drops out at the bottom, where the edges of the cones come in contact."

We need hardly stop to point out to our professional readers the erroneous views entertained by the above writer relative to the form of the millstones of the mills dug out of the ruins of Pompeii, and to the function of the open angular space termed "grinding surface," as the Pompeian mill is manifestly a decorticating or hulling mill, and not a grinding one. For grinding, the Vitruvian mills were far superior to any constructed on the principle of the inverted Etrurian pestle and mortar; and therefore it is not likely that the millers of Pompeii would have either gone backwards in the march of improvement, or have remained so far behind those of Etruria and Germany, from which latter place they got their millstones. In principle this Pompeian mill is similar to those brought from Holland into Scotland by Mr. Meikle in the early part of last century for the manufacture of pot barley. In other words, it is a decorticating mill, the inverting of the pestle and mortar being doubtless an Etrurian improvement on the mills of this kind then in common use as stated by Pliny, and for which the demand would increase as the husking of spelt by parching went out of fashion.

The nature of the improvement will thus be understood:—(1.) With the mortar lowermost, the pestle would have to be removed every time it was emptied, or else there must be a hole or mill-eye in the bottom of the mortar for drawing off the decorticated or husked grain. With a large pestle rotated by animal power or water, the former would be awkward, if not impracticable. (2.) The resistance would be greatest at the upper or widest part of the pestle when the corn was fed in, where it ought to be the least; and least at the bottom, where it ought to be the greatest. (3.) The feeding would be most awkward. (4.) The runner would be difficult to balance. And (5) the whole process intermittent and time-wasting. By turning the mortar uppermost, all these objections were obviated; and, as the Etrurians were practically acquainted with feeding in at the eye of the runner of grinding mills, the improvement was a natural one. In point of fact it was simply reducing the construction of shealing mills and grinding mills to a common principle; and in this country from time immemorial grinding mills have been made shealing mills by simply setting the stones a little further asunder during the latter process—*i. e.*, shealing. In large manufactories, where there are a number of pairs of stones daily grinding, a corresponding number of pairs may be kept continuously shealing. But where there is only but one pair of stones in the mill, they have both these functions to perform—the rule being imperative on the shealing of oats and grinding of oatmeal, barley-meal, &c. For grinding wheat for brown bread there will only be one process, or the grain will pass only once through between the stones; but the consumption of the husky part of the bran ground down to dust by "the process of clipping" in wheaten meal for brown bread is beginning to be questioned from various points of view. The modern mechanical theory of a little roughness to "*fillip*" the follicles does not appear to have ever entered the brains of the ancient Romans, and it is not at all improbable that we may go back and bring up old improvements in mills of this class with profit.

In A.D. 1546, just three hundred and twenty years ago, the grinding of corn twice was in France publicly forbidden, as being injurious to health. And although the proposition of grinding first into coarse meal and second into fine flour has often been enunciated, and in numerous instances carried out, the practice has not yet met with general favour in England. We have seen both coarse oatmeal and wheat-meal thus ground. The second grinding greatly improves the colour, popularly speaking, making it much whiter in appearance to the eye; but it depreciates the flavour to the taste, and in a much greater degree, so far as our experience extends, than the premises warrant. The increase in the whiteness of the colour is easily accounted for, from its more minute mechanical subdivision; and it will also be readily understood why a decrease of the aromatic and more volatile elements should take place, but in this latter not to the extent experienced. The Scottish ploughmen, who live almost exclusively on oatmeal, prefer it "round" to fine—the former (the round meal) being the best flavoured. The Arabs told Neibuhr flour ground by the rotating spindle pestle was better than that ground by the hand-mill, all which concur with the fining process injuring flavour; and no doubt this involves the principal reason why the French government prohibited the second grinding at the above date—A.D. 1546.

On the other hand, it is manifest that heating in the grinding drives off aromatic properties, and otherwise injuires quality, and that the proposition of progressive grinding involves a lower temperature of the flour, inasmuch as the rough meal is cooled before it enters between the second or third pair of stones, to undergo the fining process. The odds, therefore, are in favour of the theory of progressive grinding, but against the imperfect manner hitherto in operation of carrying it out into practice.

If in grinding, the millstones are stopped when full, and the upper one then raised, the grain will be found in all the stages of grinding, from the rough corn at the eye of the runner where it enters, to the fine flour discharged at the circumference. Towards the eye, it is shealed corn; towards the middle, rough meal; and towards the periphery, fine flour. Hence the twofold doctrine that has been laid down and partially reduced to practice, either by passing the grain between three pairs of stones of less diameter—the first pair to sheal, the second pair to make rough meal, and the last pair fine flour; or else to have, as it were, concentric stones, or a very large stone divided into three zones, the outer zone being a step below the second, or middle one; and the middle zone, a step below the first, with a short space, or sifting or bolting zone between each for the removal of the bran from the centre and highest mill; the fine flour from the second, and so on. Both these plans have been carried out into practice in various ways long ago; so that the principle upon which they are constructed is now public property, and special mechanism open to improvement.

10.—METHODS AND MECHANISM FOR FEEDING.

The corn was fed into the eye of the upper millstone of the ancient Hebrew hand-mill: with one hand the operator turned the mill, and with the other fed in the grain by the hand. The more uniformly the millstones were fed, the more successfully they ground, and the better the quality of the meal they produced: hence two women would make better work than one, as, in the latter case, there would be a cessation in crossing hands. It was therefore a very nice manipulation in the art of working the mill—one that was acquired by experience, and regulated by the sound of the stones, which indicated to the ear of the person or persons at the mill whether they were too full, and riding on the grain, or too empty, thereby destroying the grinding surfaces of the stones where they touched each other, and injuring the thin sprinkling of meal between them. Both in the Hebrew hand-mill and British quern there was nothing to support the runner, so as to keep it from working hard on the bed-stone, but the grain and meal between them; so that the slower the corn was fed in to a given speed of the runner, the finer the quality of the flour ground, and *vice versâ*; and the faster the mill was driven, the faster the corn required to be fed. Such facts indicate very forcibly the nature and importance of the manipulation.

When mills began to be worked by oxen, asses, wind, and water, more mechanical feeding apparatus was necessary. In the case of small ass-mills there is reason to believe that the runner was balanced on the grain as in the case of the hand-mill, the grain being fed from a basket into a small revolving hopper, as in the example of the shealing-mills dug from the ruins of Pompeii. But, long before the date of the mills found in Pompeii, the Etrurians had two plans of balancing the runner, so as to regulate the distance between the stones—the one upon a pivot, and the other on the top of the spindle, with a pendant-fixed hopper above the revolving hopper, or eye of the runner, supplying the stones with corn. So long as the mill-ass moved as fast as the millstone, or made as many revolutions in a given time, a revolving hopper was essentially necessary. But such a velocity must have been experienced too slow for grinding: for shealing it would answer; and mills of this latter kind would require a large revolving hopper to supply the stones—whether the spelt was in the outer husk, or parched and put through the mill to remove the inner husk, or bran, and the charring. Oats and barley always required shealing after parching, whether they were intended for groats and pot-barley or for meal; and such could be fed into a revolving hopper in basketfuls at a time. But when intermediate gearing was invented, to increase the velocity of the runner, a farther improvement in the feeding apparatus became necessary, when the revolving hopper may have been, and most probably was, dispensed with, the grain being then fed into the eye of the runner from the spout of the fixed pendant hopper, by means of a shoe or "shute."

It is manifest that the Etrurians must have had some peculiar mechanism for regulating the feed of the revolving hopper both of the shealing and grinding mills, whether they were actuated by animal or by inanimate power, although history is silent as to what that peculiar mechanism was. At a very early date they were familiar with the principle of a screw—a hinge-valve, sluice "shutter," or sliding valve—and the measurement of quantities by fluted rollers, by revolving cups and buckets on endless chains, and by the to-and-fro movement of the shoe, as practised in our own times; and most probably all these were tried. When, for example, the runner worked on a pivot rigidly fixed in the bed-stone, the eccentric action of the eye of the revolving hopper would involve the principle of the screw. But this alone would not regulate the feed so as to suit the demands of husking unparched spelt, parched oats, and barley. There must also have been a slide or shutter. The same mechanical conditions were involved when the pivot was fixed in the runner, and turned in a socket or foot either in the bed-stone or "bridge-tree" below; also when the runner worked upon a spindle, by means of a cross or dovetail. All these plans were in use in ancient Etruria, in the time of Vitruvius; but something more was necessary, to regulate the feed, both in shealing and grinding mills.

Plain, spiked, and fluted rollers in the bottom of hoppers for feeding have been in use from time immemorial, and so have endless bands, plain, or furnished with cups, troughs, scrapers, or brushes. The invention of such mechanisms is lost in the annals of the past. Most of them, if not all, were introduced into this country partly by the Romans and partly from the continent of Europe in more recent times, chiefly Holland. The shoe or shute, for conveying the grain from the pendant hopper to the eye of the millstone, was in use in Vitruvius' time, and was by the Romans introduced into this country. At first, it was worked to-and-fro by a woman—a damsel; but whether the invention of the mechanical feeder on the spindle, frequently termed the damsel, belongs to England, Holland, or Etruria, we are not prepared to say; but the probability is in favour of the latter. A similar mechanism was in use in the hoppers of winnowing-machines, or fanners, when first introduced into Britain from Holland, both for dressing the grain in the barn of the farmer, and in separating the "sids" or husks from the "grits" in the shealing-mill of the miller. Prior to the use of the winnowing-machine by millers, they had to effect the winnowing process on the "shealing-hill," an airy floor, where the separation was effected by the wind; or in bad weather, when the shealing-hill was inaccessible, by sail-fans, shovels, and other ancient winnowing apparatus.

Into the details of mechanism of the damsel and shoe-feeding apparatus we need not go; but we may observe that there has been considerable diversity in the carrying out of the principle, so as to effect a regular uniform flow of grain to the stones corresponding to their effective power in grinding. The principle is that of a triangular measurement of grain at every to-and-fro movement of the shoe by the feeder, the quantity of every measurement being determined by the depth of the grain upon the shoe or the distance between the shoe and the hopper, and the number of measurements by the number of to-and-fro movements, or the number of revolutions made by the spindle and runner. In theory this is very simple, but in practice the mode of measurement was subject to several objections, for in point of fact the triangular measurement was only a rude approximation, differing very much in accuracy according to the nature or quality of the grain. Hence, although it claims the respect of the miller due to nearly, if not fully two thousand years—a very long time for any peculiar mechanism to remain in daily use—it has in the long run been nearly superseded by the centrifugal "feeding cup," or feeding table, and so on.

But before the modern feeding cup and pipe came into general use, various other sorts of feeding apparatus were tried, and these demand a notice. The Archimedian screw or "creeper," which had proved so successful in conveying corn and flour, was tried in competition with the old damsel and shoe, but failed. Cups, scrapers, and brushes have long been used in corn and manure drills with success, but when tried in feeding millstones, they were beat out of the mill by the old damsel and her shoe. Measures on the periphery of a drum rotating in the bottom of the hopper have been tried with more promise, but as yet have not come into general operation. Something of this kind, however, was successfully used in the French military hand-mills by Napoleon, in his fruitless enterprise to Moscow, A.D. 1812, and the plan has been highly commended; but for large mills it is wanting in several respects, being inferior to the centrifugal cup or table, the chief objection to it being the greater complication in its working details. The principle of these measures is that of the old fluted roller or rollers in the bottom of the hopper, the flutes or angular hollows being the measures on the periphery of the drum. These cups or measures have been made larger or smaller by means of a moveable bottom, so as to regulate the discharge from the hopper above; but this part of the mechanism has as yet been too complicated to meet the peculiar demands of practice in large flour mills, where every species of mechanism must not only be mathematically truthful in its action, but also simple, to a proverb, in its construction, so as not to get out of working order. And this, too, is applicable to the minutest details; for when the smallest part goes wrong, the whole machine has to be stopped. In his mill the ear of the miller is ever attentive, and listening to the smallest alteration in the busy hum and unison of the several parts, so that when a single straw, sack-string, or the like, gets into the hopper, and deranges the feed, the stones immediately cry out for more corn; when the miller instinctively, as it were, runs to the feeding apparatus, and gives more feed without loss of time, steam, wind, or water. But small as these exceptionally mishaps are, they always less or more injure the stones and the quality of the flour. Hence the imperative demands of practice, relative to the simplicity of the feeding apparatus, so as to be easily regulated in the shortest possible space of time while the mill is going.

Before the cup-feeder had well established its practical reputation, the solution of a new proposition, viz., the artificial aëration of the millstones, imposed additional duties upon it, and these it does not satisfactorily perform. Long ago, A.D. 1810, our clever transatlantic cousins were actively scheming and carrying into effect the proposition of blowing their grain up and along pipes from one granary to another, and (1813) of pumping the flour from the mill-eye and the mill-trough to the cooling apparatus and bins in the top storeys of the flour manufactory. So early, too, as the first pneumatic railway project in this country, the pneumatic doctrine of conveying corn in pipes has been every now and then keenly discussed as to its practicability and profit, and at the present time there are several projects of this kind in force and in progress of being patented. Now, those of our readers who are scientifically and practically versed in the mechanics of mills and milling will readily perceive that this pneumatic proposition of blowing corn up pipes is opposed to the now common feed-cup apparatus, along with artificial aëration by means of blast-fans and other pneumatic contrivances of forcing a current of air in between the grinding surfaces of the millstones; for according to one old patented aërating project (No. 11,342, A.D., 1846, now public property) of closing the eye of the runner, it would not take a very strong aërating blast to blow the grain up the feed-pipe into the miller's face, whilst the smallest blast or current of air would less or more derange or counteract the natural working of the feed-cup apparatus. So manifest is this, that it would be superfluous to go farther into the details of an experimental demonstration or proof. No doubt if the aërating current of air is forced into the feed-pipe or eye of the runner or bedstone below, the upward pressure would be equally small and somewhat counteracted by the downward flow of the grain. But this may be granted without in the slightest degree refuting practically the objection, for the objection is one that is felt, and is now sought to be removed by more effective and simple mechanism.

The pneumatic conveyance of goods of every kind has now become an established branch of national industry. There is no denying of this fact, and it was no doubt a practical knowledge of this, as carried out in the old American projects of half a century ago already referred to, which prevented the early patentees of forcing and drawing in air between the millstones from closing the eye of the runner, thereby forcing a counter blast up the feed-pipe so as to derange the feeding apparatus, the even and proper feeding of the stones being branch practically second to none in the art of milling.

Of more recent improvements in feeding apparatus that have become public property, there is nothing new in principle that requires notice. Those under patent we do not propose noticing individually in the present series of papers. Suffice it to say, that perceptible progress is being made in the improvement of feeding apparatus, so as to adapt it to the aëration of the stones both on the blast and exhaust principle.

The claims of old American patents, published without drawings, do not define very clearly the details of special mechanism. In the United States there are large flour manufactories both for home supply and exportation, and in these the working parts have been brought to a very high state of perfection. In some departments of the mill they are obviously a-head of the mother-country, in others close at her heels, and in several they are perhaps behind. Under feeding apparatus they stand upon a fair equality. In addition to the plans already noticed for regulating the feed that are now public property we may mention two, both patented in 1844: the one No. 3,468, feeding in the grain between the eye and circumference of the runner where the stones begin to grind, the bedstone uppermost; and the other, No. 3,711, a centrifugal "governor," as in the steam-engine for regulating the feed.

11.—MIXING AIR AND GRAIN IN FEEDING.

In 1849 the claims of a patent are to this effect, the patentee not only claiming the special mechanism for forcing a current of air into the feed-pipe, but the mixing of the air and grain together in the feeding process, as if the like had never been done before. In many respects the improvements contained in the specification of this patentee (12,424) have considerable merit as to their special mechanism, but by grasping at principle instead of confining his claims to special mechanism he sacrificed both, and now that the whole project is public property others will in due time profit by the latter—his special mechanism. In point of fact this is already being done, both in this country and in the United States of America; while we question if ever the patentee recovered his patent expenses out of his project. Into the details of its special mechanism not claimed it would be superfluous to go: suffice it to say that it was adapted both for the damsel and shoe-feeding apparatus, and also for the cup-feeding apparatus, or, more correctly speaking, pipe-and-cup-feeding apparatus, in contradistinction from cups on the periphery of a drum, &c. As to the principle upon which the project is carried out, that will be more advantageously discussed under the next or following heading, viz.:—

12.—AERATING STONES AND GRINDING-SURFACES.

From time immemorial philosophers have been familiar with the fact that flowing water produces a current of air, and that all moving bodies in the air do the same. As an illustration, the stive in the mill may at times be seen whirling in the wake of the miller himself, although his velocity may not be worth calculating, so to speak. **Venturi** took up this branch of pneumatics experimentally, so as to reduce the facts of the case to definite physical laws. Into these we need not drag the reader beyond the latitude of our subject; for the corn which fell from the hand of the Hebrew women grinding at the mill, alluded to by the sacred writers, or from the hand of the Hebrideian lasses, referred to and delineated by Pennant in a drawing which has often been copied and mistaken for an example of the ancient oriental school, a current of air is artificially drawn down into the eye of the millstone along with the grain, and by the centrifugal fanning action of the runner is thrown out at the periphery along with the flour. The fact is one with which millers have been experimentally acquainted from the earliest period of time, or, rather, since milling became a regular branch of industry. It is one, too, easily illustrated by any teacher of agricultural mechanics in his class-room to his pupils by a hand-mill, or in the mill itself by a steam flour-mill, or to any novice who may sceptically doubt the truth of the proposition; for, when the mill is grinding lively, the effluent current from the mill-eye spout into the flour bin will blow out a candle, and so will the influent current as it passes into the eye of the runner. In examples where the stone case is open at the eye or spindle, the effluent current at the mill-spout along with the flour will be greater than the influent current along with the grain at the eye of the runner, the difference in the quantity of air being accounted for by the influx at the spindle below the casing over the top of the runner; but in those examples where this latter (the influx over the top of the runner) is prevented, the two former currents will then be equal. In point of fact, the two are only different parts or sections of the same current; the latter (the effluent current at the mill-eye spout) being less or more rarefied by heat in grinding, and hence increased in volume, velocity, and momentum. We shall find this fact noticed in one of the earliest patents (No. 2,336, A.D. 1799), which will be quoted under a subsequent head.

But, although millers have, from time immemorial, been acquainted with the influent current of air along with the corn and the effluent current of air along with the flour, they have not paid sufficient attention to the important principles involved in the facts of the case. And this, too, is not all; for they have also overlooked the fanning action of the runner, which also generates a current of air in at its eye, and out at the mill-spout when the mill is running empty. This fact is also acknowledged in the above old specification of the last century (viz., 2,336, 1799); so that ignorance of the facts of the case cannot be pleaded in excuse. We have, therefore, two effective agents, viz., the flowing grain, and the revolving millstone conjointly at work, under the old and common plan, in aërating the grinding surfaces of the bedstone and runner so as to keep them and the flour cool, and also to expedite the process of grinding; and in the investigation of the subject both these agents, and the functions which they respectively and conjointly perform, require to be kept continually under the eye, as it were, so as not to lose sight of the results at issue; for, if they are not thus closely attended to, the effect produced by counteracting agents, such as the heating of the stones and flour, and the imperfect manner the mill is constructed, cannot be practically understood: moreover, these data are all the more necessary to be attended to when parties enter upon the discussion of the links that form the chain of progress involved in the claims of inventors, whether those claims are patented or otherwise, when currents of air are forced or drawn in between the millstones by special machinery constructed for that purpose.

The flowing grain out of the hopper into the eye of the runner, like the water of a flowing stream in its channel, is a simple question of gravitation, the greatest effect being produced by a regular, continuous flow, with as little angular divergence as possible. Air, in several of its physical properties, bears a close resemblance to water; but from its elastic, compressible character, it is more easily forced or drawn through a curved pipe than water. Thus, if water were poured in at the eye of the runner so as to keep the eye full to the brim, the lateral pressure below the runner would be as the head of water or depth of the eye of the runner; but a current of air drawn or forced in would exert a greater lateral pressure below the runner than what is indicated by the depth of the eye, owing to its greater compressibility, which is greatly in favour of the aërating process when the stones are grinding lively, thereby keeping themselves clear and the flour cool. But it is otherwise when the grinding surfaces are allowed to clog, neat, and the flour to get greasy; for, in this state, the flour adheres with a certain degree of tenacity to both lands and furrows, while the influent current of air is compressed into less space in its passage through between the stones, it being at the same time rarefied by the heat; consequently a twofold obstruction is thus experienced. For in the first place, from being confined in less space, its progress through between the stones is retarded; and in the second place, from its being rarefied in this pent-up position, as it frequently is, a reactionary current backwards opposes the influent current to such a degree, that stive and steam may at times be seen for an instant to rise, with a puff, as it were, from the eye of the runner.

In passing through between the millstones the gravitating properties of the grain are reduced. This is accounted for by its being broken up into fine flour, which occupies a greater space than the grain. Still the natural tendency of the flour is to settle downwards by gravitation after it leaves the millstones, producing a current of air as it flows in a body or stream from the mill-eye spout into the bin or trough of the "creepers" or buckets of the travelling band, or well of the flour-pump in the American mills, where it is removed to the cooling-rooms and bolting-machine in a different part of the mill, by pumping and conveying-apparatus on pneumatic principles. Conjointly with the gravitating air-current-producing action of the grain and flour, the runner acts as a fan swelling or increasing both the influent and effluent currents of air. In other words, the runner acts as fanners, and the feeding-in of the grain between the stones assists in feeding the fanners with air; while the flour, as it issues in a stream from the mill-eye spout, co-operates with the fanning action of the runner in discharging the flour from the casing that surrounds it, provided the tangential demands of the periphery of the runner are complied with in the construction of the case, mill-eye spout, and ventilation of the mill generally. But if these tangential and other demands are not complied with, then it will be more easy for the miller to conceive the upshot in his own mill, than for us to describe it as applicable to his and other individual examples; and we may add, in practice these demands are very seldom complied with, hence the nine hundred and ninety-nine abortive plans proposed by non-scientific and non-practical inventors for aërating the millstones, and cleaning them of flour, stive, heated air, and steam, which will be subsequently noticed. With the manner the air is drawn into fanners, and thrown tangentially from the fans in a current, implement-makers, mill-wrights, and millers have long been familiar, and for a much longer period they have been equally well acquainted with the fanning action of the runner; but when we examine the mill-eye and spout, the tangential rule becomes the exception! and all dimensions of angularity the rule, by which stive is separated from the flour, and then flour, stive, heated air, and steam are taken off from the periphery of the runner (?) In many cases we have seen the stream of flour flowing at a right-angle to the tangent, the blast or current of air inside the case blowing right over the mill-eye, similar to a musician playing on a German flute. Indeed, for half-a-century and more, this has been the general rule in the Patent Office, as if the grand desideratum of patentees were the beating of the bagpipes in the race of progress. Practically speaking, it is the separation of the stive from the heavier particles of flour that, obedient to the laws of gravitation, fall down through the mill-eye into the trough below—the former, the stive, being forced out at the spindle, or any opening or crack in the casing, and thus blown into the miller's face; hence his "dusty coat," the waste of stive, and the modern pseudo-economical proposition of a stive-room, which we shall come at a little further on in our series of papers on "Mills and Milling."

The division of the effluent current in the process of aëration, by the adoption of objectionable mechanism, and the separation of the stive from the grosser portion of the flour thereby, is not only a superfluous, but a highly reprehensible practice—one that demands a special *exposé*, as being at variance with the progress of science. True there are many exceptions where the whole of the flow is discharged or drawn off in one volume at a tangent to the circumference of the runner, as in the example of common fanners, with far greater economy of flour than is realised on the separation principle, if principle it can be called. These we shall discuss under their proper heads, and also the objectionable mechanism by which the separation of the stive is effected. What is stive? Fine flour! In point of fact, all mechanisms by which stive is effected is defective, falling short of the normal function they ought to perform, *i.e.*, the discharge of the whole of the flour from the stones in one stream, without wasting the finest of the flour, nicknamed stive. Our observations at present must be confined to the science and practice of aëration. Every radius to the circle may have its own tangent. This was the principle upon which the Hebrew hand-mill and British quern were aërated, the effluent current being thrown of tangentially from the circumference all round upon the cloth in a continuous sheet, or zone curving parabolically downwards to the cloth or bottom of the tub, when the mill or quern was placed in such a common plan. Accordingly there may be any convenient number of effluent currents and mill-eye spouts, provided that due attention is paid to their tangential and parabolic direction. But any departure from this rule must practically be considered a departure from sound principle and effective discharging mechanism, with a corresponding separation of stive and steam from the flour, and then stagnation around the millstones, until by force they are discharged at the eye or any crack of the casing. In the former case the effluent current of heated air, steam, and stive will less or more counteract the influent current of air along with the grain, thereby preventing aëration, and inducing heating, &c. Were the mill-eye spout to branch off at a tangent in the opposite direction of the motion of the runner, air would be drawn in at the mill-eye spout thus placed, instead of being blown out. Hence, the intermediate divergencies when the direction of the mill-eye spout is between the right tangent and its opposite one, into which departures from sound principle and effective mechanism the limits of this paper will not permit us to go farther.

For a similar reason we must pass over very briefly the difference in the process of aëration when the runner is below the head-stones, between grinding surfaces comparatively flat and conical ones of the various kinds now in use, between horizontal mills and vertical mills, and between grinding mills and shealing mills. But as we shall have to discuss much of the working details of such examples under the discharge of the flour and decorticated grain, &c., from the stones and casing in subsequent papers, to these we must for the present refer the reader. In all cases the grand desideratum is to keep the air moving onwards in the right direction to the mill-eye spout without stagnation, and we may add with as little retardation in its progress onwards as possible, for when the air as it passes through between the stones is retarded, there is a liability to heating, reaction, and stagnation, owing to its elastic and expansive properties. Hence, the force of the practical maxim "to *keep the mill-stones grinding lively*."

13.—SCREW BLAST AND EXHAUST FANS ON THE SPINDLE.

Screw-fans have been placed upon the spindle in the eye of the runner, for the purpose of forcing in a current of air between the grinding surfaces of the millstones. The eye of the runner itself, with a portion of the under-surface, has been constructed in the form of a screw for a similar object; and a screw has been fixed upon the lower portion of the spindle in the mill-eye of a double conical grinder, and in the mill-eye of an inverted frustrum of a cone, for clearing out the flour and increasing the discharge on the exhaust principle. Screw-fans have also been placed in the mill-eye spout, upon a detached or separate spindle; and in several very old cases "the creeper" was placed at the mouth of the mill-eye spout, for carrying the flour to the cooling and bolting departments of the mill or manufactory, in such a manner as greatly to increase the exhaust action of the stream of flour in its descent from the millstones. And lastly, certain combinations of these screw-fans have also been worked.

Not a few contrivances of this kind have been used without being patented, and this makes it difficult to trace the footsteps of progress as to who was the first inventor of such mechanisms. It has already been shown that the old Hebrew hand-mills and British querns—from the eccentric action of the runner upon the pivot, fixed in the centre of the bed-stone—had of necessity a screw-feeding action when used for hulling, and for a similar reason they less or more forced in a current of air between the grinding surfaces, thereby keeping the stones and flour cool, although the runner rotated with its weight upon the materials being ground. It was also shown that the conical shealing cattle-mills of the ancient Romans, such as those dug out of the ruins of Pompeii, must also have had less or more a screw-feeding and screw-fanning action. In this country, screw or "worm-feeding apparatus for millstones and bolting machines" has been in use from time immemorial, no one laying claim to its invention until 1846 (No. 11,342), when a civil engineer made the discovery, laying special claim to it, with several other old mechanisms patented more than a dozen times before that date, but under different names, as will be shown under the next head. A screw or worm-feeding apparatus, for example, will be found in patent No. 9,596, 1843; and in the year following, 1844, No. 10,165, fanners are placed upon the spindle in the eye of the runner, for the purpose of forcing in air between the millstones, to keep them and the flour cool, and also to expedite the process of grinding. These latter were perhaps, more correctly speaking, constructed more after the plan of common blast-fans than screw-fans; but they had evidently a screwing action, although that is not specified, or clearly shown in the drawings. What the patentee does specify is simply as follows: "Attached to the spindle C, and above the casting, is placed the circular flange H, provided with fans or arms, the forms of which are seen in figs. 7, 8, 15, and 16." These fans or arms are represented as being like those of a common winnowing machine or fanners; but they ought to have, and may have had, a slight helical form or obliquity from the plane of the axis or spindle, in order the better to throw the air down in below the runner. In short, the language of the specification and form of the drawing referred to covers both ways, which was probably intended, almost all the old patents being specified in a general and somewhat grasping manner, so that the truth rests upon how it was reduced to practice by the inventor.

Enough has been said to show that the screw-fan in the eye of the runner has in principle been public property from time immemorial, and that its true and first inventor cannot now be determined. The probability is, that were the facts of the case all brought to light, its origin would take us back to ancient Etruria, in the days of Archimedes or Vitruvius, when engineers, millwrights, and millers were perhaps better versed in the mechanical philosophy of the screw, and its application to the arts generally, than those of the present day.

The true and first inventor of screw-fans on the spindle on the exhaust principle, and of those that work upon a separate axis, either in the mill-eye spout, or in creeper-troughs, or conveyors, or both, are also lost in the traditional obscurity of the past, when the written records of history were few and ill-defined. The historical functions of patents, in this respect, is of no secondary value, for it enables us to determine approximately, if not actually, the consecutive links that form the chain of progress—a fact upon which many of the general public are at the present time putting by far too low an estimate.

Combinations of various mechanisms are every day becoming more and more common. This is what might naturally be expected; for, after principle and special mechanism, there is nothing else worth claiming but the various combinations which special mechanisms form.

Old specifications and drawing of patents are defective in showing the combinations which they form, more especially English ones. American patents are more explicit in this respect, as in claiming they also very generally disclaim prior uses and prior publications, if we may use the phrase. Thus a miller takes out a licence from two or three patentees, and adds their improvements to others which had become public property prior to the date of the latter; consequently, his mill then exhibits a combination of the whole, and in this way there are an immense number of combinations not to be found in the records of the National Patent-office. To find out these we must pay the miller and his mill a visit; and even then there are numbers of combinations which had been previously thrown aside to make room for those now in use. In short, the combinations of old things are, for the most part, public property, or not worth much if otherwise.

This is a much more comprehensive branch of our subject than we are at present prepared with the necessary amount of information to prosecute. But when once we have received answers to queries sent out, we shall return to it as the replies come in. Combinations formed by working several patents are no less interesting to millers than to the pioneers of progress in the taking out of patents; and we are certified that at the present time the former (millers) are exerting themselves in every corner of the kingdom to procure the information they need under this head, so as to obviate the imposition now being practised upon them and obstruction thrown in the way of progress by modern patents wholly devoid of novelty. In other words, millers are beginning to follow the example of farmers, by taking a railway trip here and there, to see what their distant brethren are doing, with a laudable determination to profit thereby; and not only to advance their own individual interests, but also the interests of those to whom they pay a visit. May every success attend their exertio ns in a cause which more than merits the approbation of an enlightened public at the present time, when the staple article of subsistence calls for improvement in its manufacture.

Of expired patents there are not any combinations of blast screw fans, with exhaust and blast screw fans, that merit notice, such as a screw fan in the eye of the runner on the blast principle, and a second screw fan in the mill-eye shute, or creeper in the conveying tube on the exhaust and blast principle; but, we aver, numerous examples of this combination are to be met with in practice, patented screw fans in the eye of the runner having been adopted and put into old mills where creepers had from time immemorial been in use. Of the combinations of screw fans, with other kinds of blast and exhaust fans, we shall speak afterwards.

14.—VANES AND HORNS ON THE RUNNER, FOR BLAST AND EXHAUST PURPOSES.

In grinding with the Hebrew hand-mill, or British quern the centrifugal or fanning action of the runner was found sufficient to throw the meal or flour out upon the receiving cloth for a milling; but when the millstones were confined in a close case or curb, with only one opening through which the flour was discharged, the fanning action of the runner was found insufficient for the task, owing to the twofold obstruction thus experienced by the covering of the stones, *i.e.*, first, the outward tangential current of air between the stones, and also the tangential current of air from the external surface, or top and periphery of the runner, were obstructed; second, the whole of the flour had to be brought round and discharged through one opening, and that opening—the mill eye shute—not being in the proper tangential direction, as formerly noticed. Hence the auxiliary application of vanes, horns, and so forth, to assist the runner in grinding and discharging the flour.

These auxiliary mechanisms are of two kinds—the one for collecting and supplying air to the stones, known under various designations, but most commonly termed "horns," from their peculiar curved form; the other, for discharging the flour, air, and steam from the stones. These latter are placed upon the periphery of the runner, and are known under various local names, familiar to millers, such as "sweepers," "scrapers," "runners," "fans," "brushes," "brush-sweepers," "brush-scrapers," "brush-fans," "vanes," and so on; but the mechanical function they perform is identically the same in principle. Brushes, in addition to their centrifugal and fanning actions, are in some examples used for working over wire screens or hair sieves in the bottom, or bottom and sides, of the flour-trough that surrounds the stones, forcing through the flour, and driving the bran, &c., over the edge into its own bin, as in bolting machines.

The invention of air-horns to the runner is, we presume, of modern date, the first patent being in 1843, the air-collecting apparatuses being termed vanes. From this date (1843) to the present time the supplying of currents of air to the grinding surfaces of millstones has been annually contested in the Patent-office by rival patentees; but revolving horns have been superseded by more effective mechanisms.

When vanes or fans upon the periphery of the runner were first used is not known. The first English patent is dated 1799, No. 2,336. The patentees (Hunt and Cliffe) specify thus: "On the edge of the upper plate one or more projections of metal or other hard substance is to be fastened by screws or other means, which we call sleepers; these will keep the cover clear; or, in other words, by their means the mill will discharge itself. This purpose is accomplished in millstones by the inequality of their edges."

In 1849, No. 12,506, another patentee (Banks) thus specifies: "The runners above referred to are not shown in the drawing, as they are a well-known contrivance for bringing the ground grain to the openings, through which it escapes; but I make them deep enough to scoop out all the flour which would otherwise accumulate between the bedstone and curb."

Between 1799 and 1849 there are numerous patents, in which auxiliary mechanism of this kind is specified, more than we can quote. Thus, examples will suffice, in each of which the apparatus goes under a different name. Thus, in 1835, No. 6878 specifies brushes on the periphery of the runner; 1843, No. 9876, "scrapers" are specified; and 1846, No. 11,342, the patentee specifies and claims "fan-blades" on the periphery of the runner as if they had never been used before! although in this latter, as in the previous two examples, the function or work performed is identically the same, the brush having, perhaps, a greater fanning and discharging action than either the scraper or vane.

A vane upon the periphery of a runner performs both a blast and exhaust function. In other words, it drives the flour, air, and steam before it out at the mill-eye shute if properly constructed, while it draws the flour, air, and steam behind it. In this respect it is similar in its action to the vane of a winnowing machine, "blast-fan, or "blower." But before a blower, blast-fan, or winnowing machine will work successfully, it must have a feed current or influent current of air equal to the effluent current thrown out by the centrifugal action of the fans or vanes. This influent current is usually regulated by slides or shutters to regulate the effluent current. With such simple mechanism millers have long been familiar. Exactly the same physical laws apply to millstones, whether furnished with vanes or not, for the effluent current cannot be greater than the influent one. Part of the influent current is from between the stones, part over the runner; and when the mill is going badly, a current of air may be seen going up the mill-eye shute over the effluent current of flour, air, and steam, drawing the lighter portion of the surface stive along with it back into the space between the millstone and curb, more especially when the influent current is improperly regulated, and when the mill-eye shute is not tangentially placed, so as to co-operate with the centrifugal action of the fan. But this and other combinations of mechanism will be more profitably discussed under the next six heads.

15.—DETACHED FANS FOR BLAST AND EXHAUST.

16.—REMOVAL OF FLOUR FROM STONES.

17.—REMOVAL OF AIR AND STEAM FROM STONES AND FLOUR.

Although separate discoveries have been made at different times, and claimed under the above three heads, it will be more advisable, for the sake of brevity and perspicuity, to discuss them conjointly than separately, as the machines under each head perform the functions of the other two in many cases. Thus an exhaust fan removes, not only the flour, but also the heated air and steam from the stones, and also from the flour after it is placed in the cooling and bolting departments. Moreover, patentees, and also inventors who are not patentees, specify and claim generally, under blast and exhaust fans, all pneumatic machines capable of performing the same functions, such as air-pumps for charging or exhausting a common receiver, bellows, &c.

Our Transatlantic cousins of the United States are rather ahead of us, at least as to the priority of invention of machines of the kind in question. As early as 1810, a Mr. Bailey took out a patent for "elevating grain by blowing;" and, in 1812, he took out a second patent for the same purpose. The year following—viz., 1813—John Ewing and David Dickey took out a patent for a pump for elevating meal. The patentees all belonged to Pennsylvania; and the three projects were reduced to practice in that rich corn-growing State. In 1836, Austin Taylor took out a patent for cooling millstones. 1841, Rendleton Cheek: "Millstone dressing with ventilators for cooling flour." In 1845 (patent No. 3,969), Ferris Fareleigh says: "What I claim as my invention, and desire to secure by letters patent, is the application of air, through metallic pipes or tubes, to millstones as therein described, to prevent millstones from heating, and also facilitate grinding." A year prior to this, an English patentee (R. Gordon) obtained letters patent (No. 10,165, A.D. 1844) for "apparatus and machinery for cooling grain and flour during process of grinding and dressing," in which he forced a current of air either through the eye of the bedstone, or through holes in the bedstone by means of a detached blast fan, air-chamber, and air-tubes—one fan supplying air to the stones and botting machines; both on the blast principle. In 1846, there are no fewer than four patents for aerating millstones granted—two with the aerating apparatus attached to the runner, viz., 11,239 and 11,468; and the remaining two with detached aerating apparatus, viz., 11,084 and 11,342: the former of these latter two is an American invention. The drawings accompanying the specification (11.084 A. D. 1846) show two plans of carrying out the project—first, by a single exhaust flour-pump; and the second either by two fans, the one a blast fan for blowing in heated air at the eye of the runner, which is closed with the exception of the grain-feed pipe to prevent the escape of the air upwards, and the other an exhaust fan for drawing off the flour-stive, heated air, and steam from the stones and case. Or these may be under this latter plan—two flour-pumps, or one reciprocating flour-pump and one centrifugal fan. In both plans there are vanes, fans, or "fan-blades" upon the periphery of the runner, for bringing round the flour-stive, heated air, and steam to the mill-eye spout, which vanes have also an exhaust action in withdrawing the air from between the stones, and blast action in forcing them out at the mill-eye. In 1849, four patents were granted for aërating millstones, in two of which the process is effected by detached apparatus—viz., 12,424 and 12,506—the former by a single blast-fan for forcing in air at the eye of the runner, and the latter by an exhaust-fan and blast-fan—the air forced in from the latter passing through holes in the bedstone, as in one plan of a previous patent (No. 10,165); but with this difference, only when the bedstone is uppermost and in combination with an exhaust-fan. The exhaust-fan or exhausting apparatus is said to be only for drawing off the heated air, steam, and stive to a stive-room, not through the mill-eye spout, as in the previous American example; but through a pipe expressly inserted in the millstone case for that purpose. Under the old statute we have taken notes of ten more patents—five in 1850, three in 1851, and two in 1852. Two specify air through air-holes in the runner and bedstone by detached fans, these being the fourth and fifth examples of air through holes in the bedstone being patented. Two refer to heads not yet discussed. One (No. 13,405, 1850) has a large space between the stones and case, under which there is a revolving table for bringing round the flour to a fixed scraper or brush at the mill-eye shute, under which it passes, thus sweeping off the flour. The remainder of the ten examples have already been noticed.

It would take a large volume to contain the working details of the long list of examples thus hurriedly glanced over. There is much in them that is useful, the general drift of the whole showing that millers are slowly making headway. There are, however, not a few offsets from the right line of progression that call for notice; while the practical conclusion that must be drawn is evidently further improvement, or perhaps, we may say, go back to the principles of the American flour-pump and pneumatic elevators and coolers of 1801, 1810, 1812, and 1813, and bring up the subject *de novo*. If this is somewhat plainly off-hand and humbling, it has this to commend it, that no past patents stand in the way of future improvement, which is more than encouraging to the pioneers of progress—a commendation that is much needed at the present time.

The example of the American single flour-pump noticed above has an intermittent blast, and on that account is objectionable. Thus it makes a partial vacuum under the piston, which works in a barrel leading off upwards obliquely from the mill-eye shute, in which there is a chamber furnished with two valves, one above the ingress to this chamber, which opens when the piston rises, but shuts when it is forced down, and the other below, which has a contrary action, closing or shutting when the piston rises in drawing in the flour-stive, heated air, and steam into the chamber below the piston, but opens the moment the piston begins to descend and force out the flour to the flour-bin or elevators and cooling and bolting departments, so that as the upper valve shuts, the lower valve opens, and, *vice versâ*, as the lower valve shuts the upper one opens. But when the upper valve shuts, the mill-eye is closed, and the process of aëration consequently checked for a time—hence the objection.

It will no doubt be said, in reply to this objection, that during this interval of time that the mill-eye shute is closed by the downward stroke of the piston, there is a partial vacuum in the mill-stone case, so that whenever this is filled, and an equilibrium of pressure, restored the piston again ascends, thereby cleaning the stones and case, thus producing another partial vacuum, and so on alternately. This is no doubt the theory of the common water-pump, and also of the flour-pump in question; but in pneumatics, practically speaking, the refutation is wanting in several respects; for the air current through between the stones is of unequal force during these intervals when the upper valve is shut, while the flour from the flour chamber can only be discharged in a downward direction, two objections which cannot be over-ruled, whereas both the influent and effluent currents ought to be continuous and uniform.

The other American proposition of forcing in a current of heated air between the grinding surfaces, a proposition which has been several times patented in this country, is nevertheless one of a very doubtful character; for, if the grain contains an excess of moisture, the heated air should be applied to it in the granary according to a modern patent, which will subsequently be noticed, and not to the grain being ground between the mill-stones, where cool, dry air is essentially needed to keep things cool. No doubt very hot air would conduce to carry off steam so long as the stones were grinding lively and clean; but air heated thus would have a tendency to soften the materials being ground, making the flour adhere to the grinding surfaces, thereby producing a "greasy quality," badly coloured, coarsely flavoured, and so forth. Heating air to a moderate temperature, such as would not injure the grain, does not dry it. To dry air we freeze it purposely to condense the vapour or steam which it contains, so that to supply millstones with pure air from which caloric and moisture have been removed by passing it through pipes embedded in ice, &c., appears to be the more scientific and practical solution of the proposition for keeping the mill-stone and flour cool.

The removal of the heated air, steam, stive, and flour from the mill-stones, is a proposition which does not appear to be more than sufficiently well understood. All the patent examples we have referred to above prove this, and of the long list this proposition of "a pipe to the mill-stone case from a fan or other exhausting machine, so as to carry off all the warm dusty air blown through between the stones to a chamber ('*stive* room'), by which the dust in the mill is avoided, and the grinding improved," is perhaps the most conspicuous for its departure from sound principles, no less than for the somewhat oracular mysticity with which it is enunciated, there being felt some difficulty to give it the appearance of novelty in principle which it does not possess, the claim as expressed being contrary to fact, as the quantity of stive removed proves. In short, the proposition, practically considered, is one of cross purposes. First, the removal of the dusty air through the stive-pipe is adverse to the removal of the flour at the mill-eye spout; for however small the exhausting power may be at the stive-pipe, it is greater than no exhausting power at all through the mill-eye spout. Second, if it be argued that the practical question is exclusively one of economy of stive, only the dust in the mill being avoided by its being drawn off to the stive-room, then the so-called "plenum of dusty air forced through the stones" into the mill-case remains as before in magnitude and density, the stive only escaping through a different channel. But if this is true, then how is "the grinding improved"? But the grinding is expressly said to be improved, and therefore the exhausting power induces a current of air between the mill-stones, by removing the opposite force of heated air, which is disclaimed in order to avoid the infringement or copying of another patent. Were the improvement of the grinding disclaimed, a forced interpretation might possibly be put upon the question of the economy of stive; for it is certainly more economical to draw the stive into a stive-room, than to blow it through the mill by the expansive force of rarefied air and steam within the mill-stone case. But, unfortunately for this argument, the quantity of stive in the stive-room is said to be greater than the quantity of stive formerly found in the mill. True, not a few millers say there is as much dust in the mill as before, only the grinding is improved, while the quantity of flour discharged at the mill-eye spout is, as a matter of course, correspondingly decreased with the increase of stive in the stive-room; so that the practical question arises for solution, Why not apply the exhausting-power to the mill-eye spout, and draw off the whole flour to the cooling and bolting department, according to several American patents, besides the one patented in this country quoted above, making the exhausting power or effluent current of sufficient force to carry out all the flour, stive, steam, and heated air at the mill eye-spout, without blowing a particle of dust in the eye of the miller? Why allow the temperature of the stones and flour to rise to such a degree as to produce steam and floating stive in the mill by its adhering to this steam, and so forth, when all this fallacious economy of stive can be avoided by the adoption of mechanical systems, constructed on sounder principles, long ago public property, and now open to the adoption and improvement of any miller or proprietor of mills who may see the advantage of going a-head in the march of improvement, thus producing a finer quality of flour with less waste and expense than under the present plan of blowing dust in people's eyes at the expense of their pockets? Our subject, however, is not the improvement of mills and milling, but the examination of mills and milling as they are, and therefore we must return to one of the above American plans, which is free from the objection of separating stive from the flour, provided the project is properly carried out, either by two centrifugal fans or blast piston fans, having a continuous blast of cold dry air by means of a loaded piston and condensed air chamber, as in most blast furnaces. If the exhausting fan at the mill-eye spout is sufficiently powerful to keep the millstone case clean and the grinding surfaces and flour cool, there will be none of that choking mixture of steam and stive in the mill, now so generally experienced; but in saying so, it must be borne in mind that the millstones do not form the only source of dust in the mill, as will subsequently be shown when we come to the other departments.

The millers of the United States of America have another plan of removing the flour from the millstone-case which merits notice, viz., by forcing a strong current of air over the upper surface of the runner or upper stone by means of a blast-fan of sufficient power to blow the flour and air from the grinding surfaces out at the mill-eye spout, or several mill-eye spouts, placed in the direction of tangents from the periphery of the runner, but all joining at a convenient distance in a common pneumatic conveyance-tube leading to the cooling and bolting-rooms, the latter being so closed in as to prevent the escape of the finest of the flour, the surplus air being filtered through openings covered with cloth on the old plan, which millers and farmers have used ever since fanners were introduced into this country from the continent for ventilating the shillen-house and chaff-house.

The only other proposition which we can notice at this time is that of the above revolving-table surrounding the millstones for collecting the flour; with a stationary sweep at the mill-eye, for sweeping the flour off down the mill-eye shute (patent, No. 13, 405, 1850). As the flour is thrown out from between the stones, it falls upon this table, which carries it slowly round to the sweep at the mill-eye shute—thus consuming very little motive-power. It closely resembles in effect the old Hebrew hand-mill, or British quern, when grinding in a tub or under a hood, and the freedom with which the flour and air escapes greatly conduces to the proper aeration of the stones. When the revolving millstone has to bring round the flour to the mill-eye by its centrifugal action, three evils are experienced: (1), the flour adheres to the curb and runner, thereby increasing the motive-power consumed in working the latter; (2), the flour between the runner and curb prevents aeration, thus producing heating; and (3), the heating and friction injure the flour.

18.—FILTERING AIR FROM FLOUR, STIVE, &c.

19.—FLOUR, STIVE, POLLARD, AND BRAN-ROOMS.

20.—VENTILATION OF MILLS ARTIFICIALLY.

The above sub-headings form three links, each distinct from the others, in the chain of progress, according to the claims of inventors; but, to make a long story short, we shall discuss them conjunctly.

It has already been shown that the centrifugal action of the revolving mill-stone generates a current of air, and that the stream of flour, in falling, or flowing, down the mill-eye shute, does the same, the two forming a blast of wind, from the mouth of the latter (the mill-eye shute), sufficiently strong to put out a candle, when the mill-stones are grinding clean and lively, and when the mill-eye spout is properly placed. The consequence of this is manifest; for, as the flour falls into the bin or trough below, the stive, like the spray of a waterfall, rises upwards, and is whirled about in the mill by the motion of the exposed parts of the machinery, and draught between doors. When permitted, as it generally is, the stive may be seen eddying its circuitous way backwards to the eye of the runner, to supply the demands of the influent current of air and grain to the stones. Every revolving shaft or part of the machinery in motion less or more disturbs the atmosphere in a manner such as to keep the stive or dust in the mill alive, as it were: hence the origin of the "dusty miller." Now the surplus or excess of air thus mixed with the flour has to be removed from it by some means or other. Overnight, or when the mill stops grinding and bolting, the stive settles down, so that everything in the mill is covered with it in the morning; and even when the mill is going, much of the stive is condensed along with the heated air and steam, so that it can be now and then swept together by a gentle hand and soft brush. But this is not all; for when the mill is naturally well ventilated, or where there is a kiln going, as there always is in mills where oatmeal is made as well as wheaten flour, a current of air is thus produced to feed the kiln, generally of sufficient exhausting force to draw off stive to the kiln. Hence the waste of stive experienced even before the introduction of fanners and machinery for aërating the mill-stones and generating more dust.

To obviate the waste of stive in mills where kilns were used, two plans have from time immemorial been adopted—the one, to have a separate entrance to the kiln, so that it was fed with air from without; and the other, where the kiln was at one end of the mill and the grinding and bolting machinery at the other, the door being between, to filter the air through a canvas or cloth partition, so as to ventilate the mill-trough, and thus relieve the mill-eye shute and stones from back-draught, which with a close partition and shut doors would otherwise have been experienced from the elastic recoil pressure of compressed air. When fanners were introduced, and when vanes were placed upon the periphery of the runner, the former plan of a detached kiln was found insufficient to ventilate the mill in the vast majority of cases, where any attention was paid to cleanliness and the economy of the stive, together with the proper aëration of the mill-stones; for in such cases openings covered with cloth was the common plan adopted to filter out the air, and thus relieve the mill-case and stones; and also the fanners, which never work well if completely closed in, owing to the reactionary force of an accumulation of compressed air in a confined apartment or "hull-house," or lace in the mill for holding the refuse blown from the fannep, an apartment corresponding to the chaff-house of the barn.rs We have also seen from two to three feet of the upper portion of the sides of the chaff-house covered with canvas, for allowing the blast of air from the fanners to escape, the dust and chaff being kept in. We have known simple filtering contrivances of this kind relieve the fanners, enabling the blast to make a complete separation of the chaff, when previously, in a close chaff-house, the reverse was experienced. We have also seen pot-barley mills covered with a cloth or hood, to prevent the escape of the barley dust, which is very fugatious and penetrating. Indeed, much of the dust or stive in the mill is not the fine flour or meal, whether wheat, oats, or barley is being ground, as is too commonly believed, but the fine downy covering that surrounds the kernel between it and the husk, technically termed "dust" when separated. It is a very indigestible substance, and some ugly stories are told of how the dust of the oat, when not removed from the meal, forms balls in the stomachs of those who eat such meal. The dust of barley, or "barley-dust," is equally obnoxious; and we apprehend wheat-dust does not merit a much better character. But be this latter as it may, from time immemorial it has been a cardinal practical maxim with intelligent millers to keep the dust in question, of every species of grain being ground, separate as much as possible from the meal and flour, by partitions and openings in the same, covered with convas or cloth of some kind or other, so as to let out the surplus air, but keep in the dust or stive in the shealing department of the mill.

The proposition which is now engaging the attention of the pioneers of progress in the art of milling, of decorticating all sorts of grain before they are ground into meal or flour, so as effectually to remove the downy covering or dust along with the husk, and to perform this shealing process in a separate part of the mill or flour manufactory, is therefore, it will thus be seen, in perfect harmony with the old conclusion of millers referred to, above relative to keeping the dust as far from the meal or flour as possible, in order to produce quality of the highest market value. Into the details of this good old practice we need not go farther, for as the proposition is one that is based on sound principles, it may therefore be safely left to speak for itself, the practical solution being the improvement of decorticating machinery and processes, and of improved buildings for the adaptation of such machinery and processes.

The erection of a large flour manufactory at the present time involves a thorough acquaintance with mills and milling, to guarantee a profitable investment of landlords' and tenants' capital. Machinery of the most improved principles and construction must, of course, be adopted; and this again involves buildings specially designed and erected for it. The large quantities of flour imported into this country from the United States of America and other places, and even that which is made in our home provinces for the metropolis and other large towns situated at a distance from the mills, require the highest degree of skill and workmanship in its manufacture, in order to meet the retail demands of consumers. The heavy losses sustained on the first shipments of American flour imported into this country compelled the millers of the United States to pay more attention to the problem of cool grinding, and the preservation of the natural aroma of the flour, so as to avoid fermentation and other changes during the passage across the Atlantic. High wages also forced them to abridge labour by every mechanical means in their power. Hence the elevation of corn and flour by blast and other fans, distributing every article in close tubes to its own department of the manufactory without any waste of flour, dust, pollard, or bran, or contact with an impure atmosphere. Hence also the strong movement now being made in the United States Patent Office, and also amongst practical millers, more especially in the exporting States of the Union, to decorticate wheat, so as to remove every part of the grain that would damage the flour before the former (the finely decorticated grain, is allowed to enter between the millstones. The drying of grain by heated air in granaries, so as to bring it to the proper degree of dryness, and also the drying and cooling of decorticated grain before it is ground, and the cooling of the flour after it is ground, the excess of caloric being carried off by the air, are all propositions in the same direction of progress—old propositions many of them in principle, but new in the special machinery and architectural means by which they now require to be carried out into practice. The artificial ventilation of the mill has even of itself become a proposition second to none in the art of milling, the progress of science having laid down the practical rule that an efficient supply of pure air in the mill is as essentially necessary for the quality of the flour as for the health of the miller, a stagnant polluted atmosphere in the mill being injurious to both. An unhealthy miller and pure flour have thus become incompatible terms; and some high-flying Yankee philosophers in their theorizing reveries have even gone so far as to conclude that the emanations from the body of a healthy miller must be conveyed out of the mill in close tubes, so as not to inoculate the flour, and thus set it in a blaze during its transit from the mill to the market. This Yankee-doodle discovery may perhaps be rather fine-spun theory for John Bull; but there is no denying of the practical maxim at issue, as involved in the facts of the case, for it unquestionably takes less—infinitely less—to inoculate flour, and thus set it in a chemical uproar, so to speak, than the vast majority of our millers imagine.

There are, however, wide-awake millers amongst us, who are not altogether blind to the force of antagonistic chemical atoms in the philosophy of flour manufacture, and who are beginning to bestir themselves accordingly. The old mill maxim, "to keep separate," is just now renewing its age, like the eagle as it were, and, when fairly fledged, will doubtless bespeak an importance something more than co-equal with anything it ever had before in the simpler times of our homely ancestors. We have examined not a few old mills on purely scientific grounds; and we must confess that the impurity of the atmosphere, and its inoculating effects upon the flour and meal, always struck us very forcibly as to its chemical consequences. The mixing of damaged samples of grain with others of sound quality is productive of similar consequences in the granary—the smell and appearance of the whole proving the atmosphere to be densely loaded with the spores of fungi, and also with those microscopic little bodies of which physiologists are yet hardly half-acquainted. Much of these animal and vegetable organisms may be removed in the cleaning of the grain preparatory to grinding; but too much is often left in the grain and mixed with the flour, playing deadly havoc in more senses than one, so that mills must not only be divided into separate departments, but different qualities of grain must be kept separate from each other, and be ground at different mills; or, more practically speaking, a first-class miller, who professes to grind nothing but the finest quality of wheat, takes care not for once to pollute the different departments of his mill with a bad sample.

The machinery employed in effecting these separations is annually becoming more and more diversified in character. Of those employed in dressing the grain and flour we will speak afterwards, in another paper. That which belongs to our present lucubration embraces the subdivision of the mill into different departments, the apparatus for conveying the corn, bran, pollard, stive, and flour to their respective departments of the mill, and so on.

In some of the old grist-mills there was not much architectural philosophy displayed in dividing them into compartments. The maxim to keep separate in those simple times had reference to the millings of the different tenants whose corn and flour were in the mills. But when independent flour manufactories began to be erected in every large town, or where waterfalls could be had as a motive power, millers required granaries, garners, and so forth for the grain, and more economical methods of dressing the ground grain as it issued from a number of pairs of millstones, and had to be collected to one place for bolting. The more simple and primitive plan was to hang a sack to every mill-eye shute, and, when full, for the miller to carry it on his back to the flour-bin in the bolting compartment. The next advance was to hoist the sacks of corn and flour—the former to the granary and garners, and the latter to the flour-bin. But the confinement of the flour in sacks was objectionable, as it prevented the escape of heated air, &c., and so was the sacking of the corn from the cleaning and shealing mills. To obviate these objections, creepers, travelling-bands, cup and pneumatic elevators were invented. This was done at a very early period, while the grain and flour were allowed to descend in shutes to the millstones and sacks on weighing machines.

Creepers, we may observe to our non-professional readers, are screw-blades upon revolving shafts, each working in a box. They collect the rough flour from all the pairs of stones in one floor to the cup-elevators, which in their turn carry it to the flour-bins in the upper storeys, and in doing so any heated air or steam is allowed to escape both from the creepers and elevators. Broad travelling-bands for conveying the flour have been preferred by some millers as being better adapted for cooling the flour than creepers.

Creepers, endless travelling bands, and cup elevators, or cups upon endless travelling bands, have also long been used in conveying and elevating grain in mills.

The grain and flour under this old method of conveying and elevating was less or more exposed to the atmosphere of the mill, while the escape of stive into the atmosphere was greater than under the more primitive plan of sacks upon the miller's broad shoulders; hence the American air-tube conveyor and elevator and flour pumps of the early part of the present century, already noticed, viz., 1810-1813, plans which are now being introduced into this country in various modified forms, and the filtration of the surplus air through filtering cloth partitions, both in the dressed grain and flour departments—a plan which, for the sake of brevity and perspicuity, may be termed the *pneumatic system*.

There can hardly be a doubt raised as to the superiority of the pneumatic system of conveying and elevating grain, flour, &c., provided a suitable supply of pure air is at command; and as mills ought never to be placed in any locality where pure air cannot be had, the general practical conclusion is manifest. Should decorticating mills be brought to such a state of perfection as completely to separate the bran, pollard, and stive from the kernel, as they doubtless will, the grinding of the latter and the blowing of the flour from the millstones in close-air tubes to the cooling and bolting-rooms is an accomplished process. ENGINEER.

CENTRAL FARMERS' CLUB.

THE ABOLITION OF TURNPIKES, AND THE PAYMENT OF TRUST DEBTS.

The first monthly meeting of the Club took place on Monday evening, February 11, at the Salisbury Hotel, and was very numerously attended. The subject appointed for discussion was, "The Abolition of Turnpikes, and Provision for payment of Trust Debts," the introducer being Sir G. S. Jenkinson, Bart., of Eastwood Park, Berkeley, Gloucestershire. The meeting was presided over by the chairman for the year, Mr. E. Little, of Lanhill, Chippenham.

The CHAIRMAN, in opening the proceedings, congratulated the members present on the very excellent selection of subjects for discussion. They were now taking, he said, a little wider range than they had done for some years past. The list of subjects was not confined this year to the details of practical agriculture, but there were many other topics which were deeply interesting to the tenant-farmer; and one would be introduced that evening by a gentleman who was well qualified to deal with it. He added that there was one question stated on the card to which no name was attached, namely, "The Best Means of Harvesting Crops;" and he hoped some gentleman would soon undertake to introduce it.

Sir GEORGE JENKINSON then said: Mr. Chairman and gentlemen,—It is with great diffidence that I rise to introduce the subject appointed for consideration this evening. I have not been able to devote quite as much attention to the preparation of my remarks as I could have wished, but I have given a considerable amount of time to the subject during the last twelve months; and this will, I hope, enable me, at all events, to place it before you in a form in which you can pick out the good from the bad, and to sift what I may say, with that acumen and that intelligence with which I know you always deal with questions affecting your own interest. Without further preface, I shall now proceed to unfold this subject from what I may call the commencement. It appears that two committees of the House of Commons, one in 1836, and the other in 1864, have inquired into the subject of the abolition of turnpikes all over England; and they seem to have reported that in their opinion it would be greatly for the advantage of the community if turnpikes were abolished throughout the country. Their reports are, of course, too voluminous for me to trouble you with them. They are, however, open to the inspection of all who wish to study the subject minutely; and I will pass them by, to trace the history of the question so far as it has extended up to the present day. The next phase of the subject was connected with a circular issued by the late Government in the month of February, 1866, just a year ago. That circular was to the effect that it was proposed to discontinue the Acts of all those trusts which were free from debt, and that information was required from the trustees in such cases, tending to show whether or not there were any special circumstances which should induce the Government to maintain those Acts instead of discontinuing them. Now, that circular was the first thing that set me to work on this question. It appeared to me, from circumstances which came to my knowledge, that a very great injustice was about to be done to certain parishes, which would thus have thrown upon them the expense of maintaining roads by the abolition of the turnpikes, and by the maintenance of turnpikes in adjacent trusts. As all of you who are familiar with the practical working of the roads must be aware, it is the practice of hauliers and carters to go miles round, in order to avoid a turnpike; and therefore, though to persons living in London, and having no local knowledge of the working of the system, it might seem a simple matter of justice that when a trust debt has ceased the Act should cease also, in point of fact there are many parishes in which the result of discontinuing the tolls would be to inflict great injustice on many parishes. Take, for example, the case of a parish which abounds in limestone or any mineral, and I know several parishes which are in that position. If the tolls be removed in such parishes the traffic will be taken off the roads of the adjacent parishes where tolls still exist. Persons will poach, as it were, on the roads of parishes which are free from tolls, thereby not only inflicting great damage on those roads, but diminishing the amount received for tolls in the adjacent parishes, and proportionately diminishing the power of those parishes to pay off their trust debt. That is an evil which struck me very forcibly when I was first led to apply my mind to this subject a year ago. It occurred to me, therefore, to give a notice of motion on the subject for the Quarter Sessions of the county in which I reside, namely, Gloucestershire. Twelve months since I gave notice to this effect, that I would at the Quarter Sessions in the succeeding April call the attention of the court to the proposed abolition of tolls in certain parishes, and that I would ask the magistrates of the county of Gloucester to express their opinion by a memorial to the Secretary of State for the Home Department, that looking to the probability of turnpike trusts being partially abolished in some parishes, the fairest and most equitable mode of maintaining the public roads of the country would be by a general county-rate in every county. Now, that proposal of mine that the roads should be maintained by a general county-rate has not exactly met with general approval; and I feel bound to say that the arguments which have been used in opposition to it have so far affected the opinion which I first held, as to have modified it, but only to this extent, that whereas I see a strong opinion very generally prevailing that the Consolidated Fund should take upon itself a portion of the debt (Hear, hear)—that was, in the first instance, very much my own opinion, though I did not venture to express it publicly. I say, seeing the strong feeling which has since been generally expressed in various counties, I have adopted that view, to the extent, at least, of not wishing my first proposition that the whole expense of the maintenance of the roads and also of the payment of the debts should fall upon counties. I quite concur in the justice of that view, and I am quite prepared to modify my first proposal to that extent. I shall now call your attention, gentlemen, to what took place at the Quarter Sessions in April last year, in pursuance of the notice which I had given. The question came on for discussion at the Midsummer Sessions in 1866. I then brought forward my motion, and the subject was very freely discussed; but as you must be aware, with your intimate knowledge of all that goes on in your respective counties, country gentlemen assembled in Quarter Sessions are not always exceedingly ready to adopt a new view of any matter; on the contrary, they are very apt to look upon any novel proposal much in the same way as John Bull is represented in a picture as looking over his shoulder at some one who is walking behind him, while he exclaims, "Confound that fellow! he has a design on my pocket" (laughter). Country gentlemen almost always view with suspicion any new scheme; and, therefore, I was by no means surprised to find that what I proposed, instead of being at once adopted, was only received with great favour. The further consideration of the question was adjourned till the Michaelmas Sessions, last October. I was requested to renew it in the same form; I did so; and the result was the unanimous adoption, by the court of Quarter Sessions of Gloucestershire, of a memorial to this effect, to the Principal Secretary of State for the Home Department: "It was moved by the Right Hon. the Earl of Ellenborough, seconded by the Right Hon. the Earl of Ducie (Lord-Lieutenant), and unanimously agreed, that the following memorial be presented to Her Majesty's Principal Secretary of State for the Home Department: That the court, taking into consideration the grievances arising out of the present management of the roads throughout England, and the expenses about to be thrown upon certain parishes by the immediate and partial abolition of tolls in particular districts, earnestly presses upon the Government the expediency of taking into their early consideration the whole subject, with the view of submitting to Parliament a system which, without injustice to existing rights, may provide for general relief from tolls." That, gentlemen, was the result of my motion before the court of Quarter Sessions for Gloucestershire. I am happy to think, gentlemen, that from that time to this, the ball which I humbly set rolling has not been allowed to remain stationary. The question has since been taken up by many Chambers of Agriculture, Farmer's Clubs, and Unions. At Darlington, at Ross in Herefordshire, at Cirencester, at Swindon, in Warwickshire, and in other parts of the country the question has been raised and fully discussed; and although there is this difficulty to me personally arising from that full discussion, that very little new ground has been left for me to travel over, yet I venture to say that so important is the subject that we can always find something fresh to argue about, while the ventilation of such a question is manifestly for the interest of all classes concerned. I will now, for the purpose of discussion this evening, divide the matter into different heads. The question seems now to have been so fairly started, that the next thing we have to do is to divide the subject into different heads, and then to argue upon them. The first point which seems to me to claim your attention is the origin and purpose of turnpike-roads. Secondly, we shall have to consider the advantages derived from the creation of turnpike-roads by the various interests of this kingdom; thirdly, the expense of maintaining turnpike-roads in repair, and of the extra money required to pay for the establishments for that purpose under the existing system, and also for the payment of the trust boards and debts; fourthly, the necessity for the total abolition of tolls, and the reasons for such necessity in view of the altered state of traffic; fifthly—and this is the key-stone of the subject to be considered—the payment of the remaining portion of the debt; and, sixthly and lastly, the best plan that can be adopted for the maintenance of the roads in an equitable and efficient manner after the tolls shall have been abolished. Let me first say that, whatever suggestions I may venture to make in the course of my remarks, whatever conclusions I may draw, or whatever course I may recommend for adoption, I beg to assure my audience that I shall do so merely with a view of securing a full and free discussion of this important subject, and eliciting the opinions of gentlemen who are so well qualified as many of those whom I see around me must be to assist me with their counsel and aid. First, then, as to the origin and purpose of turnpike roads. This point has been so frequently discussed, that I shall not occupy your time upon it at any length, especially as it seems to me of less importance to consider how turnpike roads came to be created in times gone by, than how they are to be got rid of in the present day. There is no doubt, however, that when turnpike roads were first invented travelling was in an exceedingly primitive state; nor can it be disputed that the increased facilities given for locomotion by the creation of good roads, and the substitution of coaches for the pack-horse and the pilion, tended greatly to the advancement of civilization and the development of commerce. In fact, the creation of these roads was as much a march of progress then as railroads are in the present day. The purpose, therefore, of such roads may, I think, fairly be called imperial and national, rather than local; and this brings me to the second head of my subject, namely, the advantages derived from the creation of turnpike roads by the various interests of the kingdom. Now, I think that the interests benefited by the creation of these roads may be divided into three classes—imperial and national interests, the interests of towns, and the interests of the land. As to the imperial and national view of the question, I would ask, first of all, what has the imperial or national interest ever contributed towards the expenses of maintaining the great arterial roads of the kingdom? In olden times the royal journeys were all performed upon these roads; everything appertaining to royalty always passed toll-free. Whether it was His Majesty's coach of state, or whether it was His Majesty's mail, whether conveyed by four horses or by one, everything connected with royalty passed free. There can be no doubt that without these main roads royalty could not have travelled from one end of the kingdom to the other in the way that it did travel, and in a way that all loyal subjects must have wished that it should travel. With regard also to the transmission of the mails along the roads, we all know that they were always transmitted toll-free. We all know, too, that one of the principal objects of the creation of turnpike roads was the transmission of mails, this being an object in which all subjects of the realm were interested; and it may fairly be argued that the interests, imperial and national, which were served by the creation of these turnpike roads were such as fairly to demand that a portion of the expense should be borne by the national exchequer. I think, therefore, it is only reasonable to say that the imperial and national interests promoted ought to be taken into account in any future consideration of the payment of the remainder of the debt. There is one other very important item connected with national and imperial interests: I refer to the movement of troops. Now, on this point I speak as one who has used these roads very much as a soldier. I have marched almost from one end of England to the other several times, both on foot and horseback. We all know that without turnpike roads the movement of troops in this country would have been absolutely impossible; we also know that for various imperial purposes the movement of troops has always been a necessity, and that it might become a great and pressing necessity. And consequently the point which I wish to press upon your attention, and through you upon the attention of the public generally—for this is a question that cannot stand still — is that the interests of the kingdom, in a national and imperial point of view, are very largely concerned in these roads, and therefore it is that I wish to bring to a focus the assumption that we have a fair claim upon them for a contribution towards the payment of the remaining portion of the debt. All the objects that I have just mentioned—the royal journeys, the transmission of mails, the movement of troops—all these national purposes were accomplished over roads free of tolls; and there would not have been this travelling for royal and national purposes from one point of the kingdom to the other, but for the existence of roads which were originally made by the landowners; I therefore ask why the imperial treasury should not now contribute something towards the payment of a debt which has arisen from imperial interests? The second class of interests served is that of towns. I should like to know what town can deny that it has derived benefit from the turnpike roads in its vicinity; and how can any town repudiate the obligation to contribute towards the liquidation of a debt incurred in olden times, as much for the benefit of towns as for that of any other portion of the country? Let us imagine towns without roads to them. Why, they would become perfectly useless for want of feeders. I need not go very far for an illustration. When railroads first arose in England, one town—the town of Northampton—paid a very large sum of money to exclude the railway from coming to it, being too short-sighted to perceive that its interests would be materially injured by its having no railway communication. Well, what was the consequence? Why, that whatever was the sum which the inhabitants spent to keep away a railroad, they have since spent ten times as much to bring a branch railway to them. There can be no greater proof than that, that any town without a main arterial road coming to it, bringing traffic to and taking traffic from it, must perish. Every man who is well acquainted with the country must know towns which have gradually dwindled down from prosperity to decay because a railway had diverted the traffic to another town. We must all be aware of such cases. No further argument can be required to show that towns have at all times been immensely benefited by roads; and therefore it is not from any town that we should expect to find dissent from a doctrine which I have laid down, that the imperial exchequer ought to bear its share of the expense of those roads by which towns so largely benefit. The next interest to which I shall allude is that of the land. Now I need not say to those present that the land will never shirk any duty that fairly devolves upon it. The land is that interest which cannot run away; and when there is nobody else to pay for anything, it is generally put upon land (Hear, hear). In this case land is made to pay for the whole—for the past, present, and future maintenance of the roads. In order to show you that landowners have no option in this matter, I will read an extract from a legal decision pronounced by a high legal authority on this question, lest you should imagine that parishes are not legally liable for the repairs of their turnpike roads. The origin of turnpike roads is given on high authority (Lord Abinger, when Chief Baron of the Court of Exchequer) as follows:—" Certain individuals, with a view to the repair of particular roads, subscribed among themselves for that purpose, and erected gates upon the roads, taking tolls from those who passed through them. These (says his lordship) were violently opposed at first, and petitions were presented to Parliament against them, and Acts were in consequence passed for their regulation." The violence of the opposition to turnpike gates and tolls was at first great. But by slow degrees it subsided, and England at length became traversed in every direction by some (as Macaulay states) 30,000 miles of turnpike road. Now, gentlemen, let us pause for a moment to consider how great and beneficial must have been the effect produced by the improvement of the roads under this turnpike system, and here I would remark that the benefit conferred was not, as I conceive, on any parish or district merely, but on the country at large. The advantages were undoubtedly and necessarily to a certain extent local, but they were to a large extent, and chiefly, national advantages, by which the whole community was benefited. It has been well said, that of all inventions (the alphabet and the printing-press alone excepted) those inventions which abridge distance have done most for the civilization of our species, and that every improvement of the means of locomotion benefits mankind morally and intellectually, as well as materially, and not only facilitates the interchange of the various productions of nature and art, but tends to remove national and provincial antipathies, and to bind together all the branches of the great human family. And if this be true (and it must be admitted to be so), shall we not all agree that the introduction of the turnpike system and the outlay of money in making the roads (whether that money was advanced by the Government or individuals) were and have been found to be for the general good and the material advantage and advancement of the whole kingdom of England' I have dwelt on this part of the subject somewhat fully, because a good deal, as I think, will depend on it when, by-and-bye, we come to consider another part of the subject, that relating to the bonded or mortgage debt still subsisting under the turnpike system. Now, you are all aware that by common right, that is by the common law, the general charge of repairing all highways lies on the occupiers of land in the parish wherein the highways are. And not forgetting this, let me ask you also to bear in mind that turnpike roads are highways, and the parishes in which they are situate are liable to be indicted for their non-repair. Thus, it was laid down by Mr. Justice Parke, " That it is a mistake to suppose that the object of the turnpike Acts is to relieve parishes and townships from the burthen of repairing the highways. Their object is to improve the roads for the general benefit of the public, by imposing a pecuniary tax in addition to the means already provided by law for that purpose. The obligation to maintain all public roads (with the exception of those which are to be repaired *ratione tenuræ* or *clausuræ*) is a public obligation, and in the nature of a public tax. The repairing by parishes or townships of some part, and by counties of other parts, are merely modes which the law has provided for discharging that obligation. It is their share of the public burthen which those districts have to pay, and which is imposed for the general benefit of the community, and tolls are an additional tax for the same purpose." Thus, therefore, gentlemen, it will be seen, and it is most important not to forget, that the principle of the common law by which, whenever a highway was out of repair, the inhabitants of the parish were bound to reinstate it in good order, has always been, and still is, applicable to turnpike roads; and hence it will be seen that turnpike trusts, and the moneys which they raise and expend in keeping turnpike roads in good condition, were in fact established " in ease and relief of parishes, and not as an absolute discharge of their liability." Gentlemen, you will perceive from what I have just read that the land—*i. e.*, the parishes—is at this moment liable for the repairs of all turnpike roads, as well as of the parish highways, and that in the event of the tolls being found insufficient, it is bound to provide the money required for that purpose. Let me give an instance. The Gloucestershire Chamber of Agriculture sent a certain number of questions on this subject to individual occupiers of parishes. Among the answers received there is one from Mr. John Wells, of Hampnet, near Northleach. Besides being asked, What is the rateable value of his farm? he is asked, " What is about the average amount of tolls you pay per annum?" Answer: "£25 per annum, besides a contribution"—mark this, gentlemen—" besides a contribution to the turnpike-trust of £36 per annum." Here we have a striking illustration of what I said just now about the land not being able to shirk its obligation in this respect. This case clearly shows that the land is primarily responsible for the repair of the turnpike roads, in addition to the highway roads.

A MEMBER: What was the rateable value in that case?

Sir GEORGE JENKINSON: The rateable value is £1,116. I have here (holding up a book) some very valuable statistics relating to this subject, all tending to show the liability of the land. We first got information from twenty farms in Gloucestershire; but it having been objected when I first introduced the subject at the Quarter Sessions that twenty farms afforded no criterion, we sent out the questions to no less than 253 farms, extending over 120 parishes. The total rateable value of all those farms is £84,580 4s. 2d.; the total amount of tolls paid by them is £1,065 6s. 2d. The total rateable value divided by the total amount of tolls paid gives a rate of about 3¼d. Citing those figures, I showed at the Quarter Sessions when the subject was last discussed that the entire amount of tolls levied in Gloucestershire was about £50,000, adding that what was paid on the average by the whole county for the roads was equal to a 7d. rate. At the same time I proved by figures that the whole expenditure on the roads in Gloucestershire was under £30,000 per annum, showing a difference of £20,000 between the amount raised and the amount expended on the roads. It showed that a 4d. rate, which would raise £30,000 a year on the rateable value, would amply pay not only the whole expenditure for the maintenance of the turnpike roads, but also the interest on the trust debt of the county; so that the ratepayers might be benefited by the saving of at least 3d. in the pound. What I have thus mentioned may be taken as a fair criterion of the waste of public money in Gloucestershire; and, from information which I have received, I infer that there is almost an equal amount of waste, viz., two-fifths, going on in almost every other county in England. The expenses of the toll-gates, the profits of lessees, and incidental charges must be much the same in all counties; and I think therefore great national benefit must arise from the abolition of tolls and the adoption of a fair mode of levying the cost of roads. I think that the future maintenance of turnpike roads ought to be arranged so as to be in conjunction with that of the highway roads. I think the Consolidated Fund ought to liquidate, by annuity or otherwise, the small remaining debt. Let me ask you as practical men whether, if any of you had ordered an engine or some other piece of machinery, and after using it for a certain time, had found that something else suited your purpose better, you would think it right to throw the expense of maintaining that engine or piece of machinery upon others. This is very much the case of the turnpike roads of England, which have been superseded by railroads; and I say that the Government, having for a long period used these roads for its own purposes, cannot now justly turn round upon the landlords and say, "We don't want these roads any longer, because we now use railroads; you may continue to use them if you please, but whether you do or not you must maintain them, and pay all the old debt on them besides." That is the present state of the case, and I must say that such an injustice ought not to continue. I now come to my third head' namely, the expense of maintaining the turnpike roads in repair, and the extra money required to pay the establishments kept up for that purpose under the existing system, and also for the payment of the trust bonds and the trust debts. Now, I have shown, with regard to the county of Gloucester, the difference between the amount raised annually, which is £50,000, and the amount required, which is something like £28,000; I have before assumed it to be £30,000. The amount of the revenue from tolls in England was, according to the last official return, which was made in 1862, £1,429,000. The number of turnpike trusts in England is about 1,000. The total amount of the bonded or mortgage debt is £4,137,876. But it has been stated that the amount of the debt may, in fact, be fairly reckoned at something like £3,000,000. It must, indeed, occur to many gentlemen here, as an obvious truth, that it is not every debt that can be reckoned at par. I need not refer for illustration to the Overend and Gurney case, or to the case of the London, Chatham, and Dover bonds (laughter). It would be quite a mistake to suppose that every debt in this country is to be taken at par. I myself know some debts which have been compromised at a loss of not less than 40 per cent.; and, as regards the debts of turnpike trusts, the estimate which I have made, on tolerably good authority, is that, while the nominal total is £4,137,876, the aggregate debt may be fairly put down at £3,000,000. Now, supposing the Government were to take the burden of that £3,000,000 upon itself, in the shape of an annuity of three per cent. for twenty years; and, remembering that these turnpike bonds were originally granted to individuals who lent their money at a high rate of interest, that they were renewed from time to time as they ran out, and that the persons who advanced money did it for a large rate of interest, and with their eyes open, well knowing that the trust was only for a limited period; I think they might well consider this a fortunate settlement of their claims. Reckoning the total debt, I say, at £3,000,000, an annuity of three per cent. would be something like £90,000 a year. Now, I do not think £90,000 a year would be a very large sum for the nation to pay for the remaining debt of these turnpike trusts, considering how very much, as I have already pointed out, imperial interests have benefited by these turnpike trusts, and that they have never contributed towards their maintenance. I think a contribution of £90,000 a year for twenty years to expunge the debt, leaving the roads possibly to be maintained by the counties through which they pass, would be a fair and proper settlement; and I do not think any one could grumble at such a small boon being awarded to the landed interest throughout the country.

A MEMBER: Should that expunge the debt?

Sir GEORGE JENKINSON: Yes, at the end of twenty years. Of course, in any settlement of that kind there would be a proper kind of valuation; but my own opinion is that £3,000,000 would be about the total; and, if that were the case, £90,000 a-year would be sufficient. In reference to this, I may say that in 1864 a committee of the House of Commons reported that a payment of £180,000 for 25 years would liquidate the debt, taking it at 3 millions; but that is at the rate of £6 per cent. for 25 years, which estimate is, I consider, excessive. There is another point of view in which this matter ought to be presented, and that is that, at the present moment, farmers, even under the most favourable circumstances, are paying for the maintenance of the highways, in addition to paying tolls upon the turnpike-roads. This is a point which I have never yet seen put; but it is one which is, I think, well deserving of the attention of farmers who are paying the highway rates. I think also that the abolition of tolls ought, for the reason which I stated at the outset, to be simultaneous, because anything like a partial abolition entails loss on parishes adjacent to those in which the tolls are abolished. The payment of the debt is my next head; and, as I have before remarked, that is the keystone of the whole matter. With regard to that point, however, I have entered into the argument rather before I intended to do, because I was asked questions about it, and therefore I do not think I need dwell further upon this head. I think I have shown that the payment of the debt, though it be the main difficulty, is not of such a nature that it cannot be got over. I now some to the last head, which is, the future management of turnpike-roads. With regard to this, I have received letters from different places. I have one letter from Essex, where there are no tolls, because no debt exists. The writer of this letter—Mr. Hawkins, and I have authority to use his letter—points out that although, after a long discussion, the tolls of the whole county of Essex had been abolished because the debt had been paid off, owing to there being no very precise information on the subject, the question has now arisen, how the roads are to be maintained in future. There are, he says, only two districts in the county in which highway boards have been established; and in all others the burden of the roads falls on the parishes through which they pass. That brings me to the subject of highway boards. If my plan were adopted, it would be necessary that highway boards should be made general throughout the country; and I believe that if the management of all roads were thrown upon the highway boards, and if their powers were so extended as to embrace all the roads in the kingdom, using the existing staff of the highway board in every county, you would save all the expenses of the turnpike-gates, the present district road surveyors—in short, all the expenses of turnpike-road machinery, amounting, in my own county, to £20,000 a-year out of £50,000 raised by tolls. I believe that the roads would in that case be better looked after under such a system than they are at present—that the supervision would be far more effectual. In order to carry out my suggestion there would be required an extended Highway Act following upon the entire abolition of the existing Turnpike Acts. Here is another letter which has been placed in my hands by the Secretary—a letter from Mr. H. H. Tatam, of Moultan, near Spalding, in Lincolnshire. It is as follows:—

> Moulton, Jan. 29.
>
> Dear Sir,—I see you are about to discuss, on Monday next, the merits of the "Abolition of Turnpikes" and "Provision for Payment of Trust Debts." Having successfully carried through such a measure in this district, I forward you the particulars of our proceedings. In consequence of the opening of the Norwich and Spalding Railway, which runs parallel with the turnpike-road from Spalding to Sutton Bridge, our revenue derived from tolls was inadequate to meet our expenses; and I adopted the following course, being interested as a trustee for the turnpike-road, a large charge-bearer, and also a large contributor by the payment of tolls: I called the trustees together, by notice through the clerk, and showed them that they must either proceed to obtain funds by a rate-in-aid from the parishes through which the turnpike passed—a very expensive and unsatisfactory proceeding—or endeavour to persuade the parishes to maintain the roads, and allow the revenue derived from the tolls to be applied to the liquidation of the debt. The latter course was adopted; and the surveyors of highways in the several parishes were requested to call vestry-meetings, to consider the matter. The vestries in all the parishes but one decided to act in concert with the trustees, and get rid of the tolls as quickly as possible. The parish refusing—Sutton St. Mary—ultimately acceded to the same course; and in two years the debt was paid, and the tolls abolished. If the charge-bearers will fairly consider the matter, they will find such a course most desirable, as, in our case, we get rid of a staff costing between three and four hundred a year, and the parochial surveyor can look after the labourers more effectually, and maintain the roads at a less cost, than a surveyor who has many miles in length to look after, and who either cannot, or did not in my district, spend sufficient time in looking after his labourers to obtain from them the amount of labour for which he paid; and, now all long traffic has ceased in most localities, and a turnpike is only used and maintained by those resident in the locality, it is a tax upon themselves to maintain a clerk, surveyor, treasurer, and pikeman. Our turnpike-road was 24 miles in length; and about forty years since, our debt was £13,000. At the time we were unable longer to pay our way, and to have recourse to the expedient I have stated, we had only a debt of £1,200. A similar course has been adopted on two other turnpike-roads, partly in our division, and in the greater part of the division of Holland, in the county of Lincoln. We have, without the aid of "Rebecca," nearly annihilated turnpikes, and scarcely feel the additional cost of maintaining the roads. Trusting the length of my letter will be pardoned if my communication is of any value,
>
> I am, dear sir, yours truly,
>
> Henry H. Tatam.

I have referred to this letter chiefly in order to point out that, however good the expedient in question may be in itself, it is open to the objection of being voluntary, and being liable, therefore, to be upset by any one parish in the whole district; and it is to get the thing done by means of an Act of Parliament extending over the whole kingdom that I have set the question in motion. I think that if the mode of settlement which I have indicated—of course it would have to be altered according to circumstances or necessity—were adopted by the Legislature, it would place the matter on a fair basis, it would place the burden on the right shoulders. It would not be fair to have a partial measure; it would not be fair for some parishes to have to pay an extra charge for districts which would have the largest share of traffic. I think that the whole county should pay for the roads of the whole county; I do not think that a certain number of parishes should pay the whole expense, while other parishes pay nothing at all (Hear, hear). Gentlemen, I am not aware that there is any other point remaining to be touched upon. I should wish, as I have before said, a county-rate to provide for the repair of all the roads in the county, the then existing Acts being all merged in an enlarged Highway Act. The present state of the law is very defective. Under the Turnpike Act there is no provision made for the case of a person's driving furiously. I have seen persons driving in that way along a turnpike road, to the great danger of other passengers, whether on foot, or on horseback, or in vehicles, and I have found that there is no power of summoning a person so acting on a turnpike road, though there is if it occurs on a highway. I was contradicted when I said this at Gloucester; but the gentleman who contradicted me subsequently forwarded to me a letter from his legal adviser, in which it was stated that he was in error and I was right. There is no power, either, to summon persons whose cattle have trespassed on a turnpike-road; and as to the pound, every one knows that the pound-man, like the policeman, is never to be found when he is wanted. Fences may be damaged or destroyed, and accidents caused, without there being practically any power of punishing the offending party. For these reasons, I say the old Turnpike Act is very defective; and it would be for the benefit of the whole community if it were abolished, or merged in an extended highway act. With regard to the question of a county rate being levied for the payment of all the expenses of roads within the county, the present turnpike-roads as well as the highways, some persons have thought that it would be better to impose a special tax upon hauliers and other people of that kind, who keep horses and carts for the carriage of coal, limestone, and other heavy substances. That is a proper matter for discussion; and the whole question of the best mode of maintaining roads might be safely left, I think, for the decision of a committee of the House of Commons. I hold in my hand some resolutions on this subject, which I should be glad to see adopted by the Central Farmers' Club, and embodied in the form of a petition or memorial to the Government. I will read to you what I have sketched out. Of course, the matter is one for discussion; but I should be glad to see something tangible and definite emanating from this Club. An expression of opinion on the part of a body like this is likely to have weight with any Government; and I am quite sure it will have weight with the Government now in power. The first resolution which I would submit is in this form: "That the abolition of turnpike-tolls would be a benefit to the community; that, being as they are, costly in collection and unequal in their pressure, they ought to be abolished; and that the abolition should be simultaneous, and not partial." The second resolution is: "That all the remaining debts should be made a charge on the Consolidated Fund, because imperial and national interests have so largely benefited by turnpike-roads, without having contributed to the cost of making them, or the annual expense of their maintenance." The third resolution is: "That the future maintenance of turnpike-roads would be best effected by amalgamating them under one enlarged Highway Act, to be carried out by the existing highway boards, or by similar boards to be established where necessary throughout the country; and the mode of raising the necessary funds for the extra expense thus incurred should be settled upon an equitable basis, by a committee of the House of Commons appointed to investigate and consider the matter." These resolutions embody the substance of the changes which I have suggested; and I think that, if something of this kind were adopted by the Legislature, it would be very likely to lead to beneficial results. And now I will venture to suggest that there is a moral connected with the discussion of this question of the abolition of turnpikes, as there is, indeed, a moral involved in the discussion of all important topics. What, then, is this moral? Turnpikes are *doomed*. They have served their turn, and, like the old coaches which ran upon them, and which have had to yield to the railways, so must the old roads yield to their iron rivals. It is but a type of everything human, even of man himself. We must all make way, generation after generation: we must all bow, men and things, to the inevitable law of Nature, to the onward march of Time, of Events, and of Progress, which overtakes and puts on one side everything in its turn, and which is only the forerunner of that great law of Nature which proves that our Creator never intended anything to stand still, or to remain not subject to change, until that great change of eternity to which all things and all men, all nations, and, finally, all creation, inevitably tend. Thus we should all endeavour to assist in the passing of such changes, that they may in their progress do as little injury and as much good as possible to the general community (cheers).

Mr. W. Brown (Tring) wished to know what was Sir George's estimate of the cost of maintaining the turnpike roads of the kingdom.

Mr. James Howard (Bedford) said he was quite sure they all felt very much indebted to Sir George Jenkinson for the manner in which he had introduced that important subject to the consideration of the club (cheers). He (Mr. J. Howard) was one of those who thought that ere long turnpikes would be among the things of the past (Hear, hear). He was aware that there was a very general opinion in this country that those who used the roads should pay for them. That might appear sound, but he would take a rather broader view, and would say that those who are benefited by the roads should pay for keeping them up; he thought that principle would touch a great many others than those who simply used the roads. He believed that the roads of this country should at this time of day be perfectly free. The attention of the agriculturists of England had as yet scarcely been turned to the subject of road reform. The Scotch had in this, as in many other matters, set them a good example. For many years past a great movement had been going on in Scotland to clear the high roads of the incubus of a tollgate, and very much had been done in that country, both locally and nationally, to get rid of this impost. Many of them were aware that the Scotch induced Lord Derby, when he was in power before, to institute a royal commission to inquire into the whole subject; if Lord Derby thought it right to appoint a royal commission to inquire into the action of tollgates in Scotland, surely, considering that its area was so much larger and more important, he could not refuse to take a similar course with regard to England. He was sorry to disagree with Sir George Jenkinson with respect to the propositions which he had made, but he should conclude the few remarks which he had yet to offer with an amendment. He thought that to legislate on that question at the present moment would be to legislate in the dark. Which of them knew the state of their own turnpike trusts? Having looked into the matter in his own county, he had found it surrounded by difficulties. The whole subject was, in fact, involved in mystery. There was, however, this startling fact, that the tolls of this country cost something like 40 per cent. to collect (Hear, hear). He thought it was a very potent objection to a tax of any kind that it required 8s. out of every sovereign to collect it. The present system was most circuitous, and would not bear criticism for a moment. To spend such an amount in collection was absurd. He was sure none of them would think of imitating such a system in their own business. He was for having a general measure. He would have no piecemeal reform in this matter. Let the whole question be placed before the country, so that the public could understand it. He saw no hope of the subject being thoroughly understood until that had been done for England which was done for Scotland, and a royal commission had inquired into the nature and amount of the debts, and how the roads should be kept up for the future. He did not see how in that case the towns were to escape their fair share of taxation. If they went into the vicinity of any large town or city, either early in the morning or late at night, they would be almost sure to see the horses and vehicles of merchants and tradesmen being driven along the road. If the whole of the roads were to be maintained by a county-rate, the towns would entirely escape. As he said before, he was of opinion that there should be a full inquiry into the whole subject before any legislation took place upon it; and therefore, without wishing to oppose Sir George Jenkinson for one moment on this question, he should move the following amendment:—

> "That until a royal commission has been formed to investigate the present position of the turnpike trusts, and has reported upon the best mode of dealing with the whole subject, it is inexpedient to adopt the resolutions proposed by Sir George Jenkinson."

Mr. J. J. Mechi (Tiptree Hall, Kelvedon, Essex) observed that the county of Essex was out of debt and owed nothing on account of its turnpikes, and had abolished them. Whether that arose from good management or from other causes he could not say. How far it would be just in such a case to adopt such a strong measure as was proposed by Sir George Jenkinson, and make them pay over again for that for which they were not responsible, he would leave this meeting to say. He was inclined to think it would not be just, but there might be circumstances which would modify his view. With regard to the argument that roads were used by town's-people, it must be borne in mind that the streets were paved at an enormous expense, and that no toll was levied on that amount upon agriculturists who brought their produce. They must look at the subject in a larger point of view, remembering that if each were to pay in proportion to use the result might be the same as it was now. One thing, however, was quite certain, namely, that it was desirable that tollgates should be abolished, because railroads now absorbed nearly all the traffic. The difficulty of maintaining roads was much increased by the diminution of traffic; and this was a strong reason why the debts should if possible be paid off. This last point, of course, involved a question of good or bad management, which might form a subject of investigation in any inquiry; and it would, he conceived, be a fair matter for consideration, whether those who had managed their roads well, as was the case in Essex, should be called upon to bear the burden of mismanagement on the part of others.

Mr. H. Cheffins (Easton Manor, Dunmow,) was sorry that there seemed to have been a tendency to confine the question to the county of Essex, which was mentioned especially, both by Sir George Jenkinson and Mr. Mechi; but as an Essex man, he stated that they were free from tolls in the country districts, and that except in the metropolitan district they were free from debt. He would, however, warn his brother-farmers, that before they allowed the burden of the roads to fall on their shoulders, they should be very careful that they were first put in good repair. He knew and travelled over one road which was in a state that was disgraceful to the trustees and surveyor: he referred to the Dunmow Turnpike Trust. In that case the road had been used by the contractors for some railway works, which were parallel to it, for the last two years; an enormous amount of tolls had been received, and there had been but little done in the shape of labour. Such was the state of that road, that when he had to travel over it he was sometimes compelled to have two horses instead of one. The trustees never came near, and anything more disgraceful than the state of that road for the last three months could hardly be conceived.

Mr. J. A. Nockold (Stort Lodge, Bishop Stortford,) said he had merely risen as an inhabitant of the district to which Mr. Cheffins had referred, to express his concurrence in his observations. He would only add, that five-and-twenty years ago he would have challenged all England to produce a better turnpike-road than that from Bishop Stortford to Dunmow.

Mr. H. Trethewy (Silsoe, Ampthill,) said a great many questions had been discussed since that Club was established, but he doubted whether any subject had ever been introduced, upon the details of which they were so ignorant as they were in reference to those connected with the subject just brought forward by Sir George Jenkinson. The question of turnpikes had come upon them, he might almost say, by the act of the Legislature, rather than in the shape of a complaint of the landed interest, or of agriculturists generally. He must say, however, that he hoped the Club would not commit itself to such a regulation as that of Sir George Jenkinson, for he thought that would be taking a step in the dark. He (Mr. Trethewy) was not quite prepared to second the amendment of Mr. Howard, although he went a great way with him. He would not wait for a royal commission, but he would wait for some information which they had not yet before them. As regarded the comparative state of turnpike-roads and highways, he could only say that as a traveller—and he had travelled a great deal and in a great many counties of England—he had invariably found that the thicker the toll-gates were the worse the roads were (Hear, hear). As regarded the evasion of tolls, it was well known that both dealers and drovers could go from one end of England to the other without paying any toll. Sir George Jenkinson's remarks on that subject were fully borne out by facts. How far agriculturists generally would benefit by the abolition of tolls and by having the repair of the roads thrown upon themselves was a question which he did not profess to be able to answer. He thought it very questionable whether any benefit at all was likely to arise. At all events, unless care was taken that the roads were first put in a thoroughly efficient state, in accordance with the suggestion of Mr. Cheffins, they would, in his opinion, be very great losers. Supposing tolls were abolished, the maintenance of the roads in future was a problem exceedingly difficult to solve, and as he had said before, they had not sufficient information before them to enable them to deal with that question at all. If a county-rate were established, it would require very good management, very great thought, to make it equitable. Some parishes would perhaps be unduly assessed, and others, escape with a very slight payment. Take, for instance, a district where minerals abounded: those present who lived in the neighbourhood of coprolites must know something about what he was going to allude to. He knew parishes in which coprolites were raised and carried off, where the roads were in a very bad state indeed. They were entirely cut up by the removal of coprolites, and the parish had to repair them. He should be glad to know how that question was to be dealt with. The rating of those coprolites would be something like the rating of mines; it would raise a question which had been found exceedingly difficult to deal with before, and would, he believed, be found so again; but if any legislative measure should be introduced, that part of the subject should be borne in mind.

Sir **George Jenkinson** inquired what roads Mr. Trethewy referred to?

Mr. **Trethewy** said, he was alluding to highways: of course if coprolites passed over turnpike-roads they had to pay toll.

Mr. C. **Andrews** (Laysters, Tenbury) would be very sorry indeed if the Farmers' Club should commit itself to Sir George Jenkinson's propositions, and agreed with Mr. Howard that there should first be an inquiry into the subject. He admitted that the time had arrived when highways and roads now managed by turnpike trustees should be brought under the same management, but he had yet to learn how the cost of maintenance was to be fairly adjusted. He could have wished that Sir George Jenkinson, instead of quoting as he had done from the letter of an Essex agriculturist, had read that letter entire. It appeared that tolls had been discontinued in the writer's district, and he surmised that there was some intimation that it did not answer the purpose. He thought the best course that Club could pursue was to wait a little and seek an investigation. Since the compulsory reduction of the debt many of the roads now maintained by tolls had been gradually growing worse, and some of them were at present almost impassable. If the burden of maintenance was thrown on a county-rate no one might be able to tell how the money was expended. He maintained that the traffic on the roads generally had not, as was commonly supposed, been diminished during the last few years. Instead of being reduced in amount, it had only been transferred from one road to another. Sir George Jenkinson proposed that there should be some tax upon hauliers, that is persons who hauled for hire. Did he consider the great difference between the case of a gentleman who kept a large establishment, including six or eight carriage-horses and two or three carriages, and that of a farmer occupying 150 acres of land and assessed to the rate for the same amount? Let them compare what a gentleman in that position paid in the year for tolls with what the farmer paid, and remember that if the burden of maintenance was thrown on a county-rate they would pay equally. This was a matter, he repeated, which required further discussion before the Central Farmers' Club could commit itself to any resolution.

Mr. **Duckham** (Baysham Court, Ross) said he rose with great pleasure to second Mr. Howard's amendment, Mr. Trethewy having declined to do so, he fully agreeing with Mr. Howard and Mr. Andrews that the subject was one which required a great deal of consideration, and involved much more than it appeared to do on a first glance. Mr. Andrews alluded to the necessity of taxing the carriages and horses of gentlemen passing to and fro daily along turnpike roads, and to the possibility of landowners and others being rated in that way as highly as the tenant farmer. In his (Mr. Duckham's) neighbourhood—and he had no doubt the case was the same throughout the country—there were many persons who would have to pay little or nothing to a county rate who would do much more damage to the roads than farmers occupying several hundred acres of land, with a proportionate number of horses, and in such cases farmers must pay considerably if the cost of repairs were to be met by a county rate. That was a matter which required to be settled on equitable principles. There were other points which should be taken into account; for example, the rating of mines and timber. The whole system of road maintenance must be carefully inquired into before an equitable adjustment could be made, and the land saddled with this branch of the greatly increased burden of local taxation. Individually, he did not grumble at the working of the highway system. He was a great lover of good roads, and would rather have a good road to send his teams along than one which was almost impassable, even if the expense were greater. He knew the thing worked very well in his own district. Having taken great pains to understand this question, he had no hesitation in saying that the abolition of the turnpikes throughout the kingdom would double the rate for the repairs of highways. This was a subject which ought to be treated, not in a local, but in a national manner. The total income of turnpike trusts in England, in the year ending Dec. 31, 1862—the last year the official return had been made—was £1,064,067 9s. 3d.: the total income in Wales, in the same year, was £78,503 5s. 1d., making the total for England and Wales £1,142,570 14s. 4d. A great deal had been said with regard to the expenditure on labour and materials for the roads in England being but little in excess of half the income. He had gone carefully through the figures connected with that part of the subject. He found that the total expenditure in England, in 1862, under the heads of manual labour, team labour, materials, damage done in obtaining materials, tradesmen's bills, and statute duty, was £636,972 6s. 9d.; in addition to which there was an outlay of £76,477 14s. 1d. in salaries, making a total of £713,450 0s. 10d. The turnpike trusts could not be placed upon the rates without paying salaries to clerks and surveyors. There must be establishment charges for working; and the thing could not be done for the same amount that was paid for the management of the present highways. There might be a reduction of expense when all the roads of the country were under one management; but it could not be done for nothing. The law expenses, interest, improvement, debts paid off, and incidental expenses, of the turnpike trusts amounted, in 1862, to £364,557 12s. 2d. He certainly felt himself that they had a right to look to the Consolidated Fund for some assistance, and that it would be more equitable for Parliament to make an annual grant than to give assistance in paying-off debts. There were many turnpike trusts throughout the kingdom which had been provident, and saved their income for several years past, and had, in consequence, been enabled to pay off their debts; while there were other cases in which the state of things had been just the reverse of that; and he certainly thought there was a sort of equity to be observed in reference to such differences. On the whole, he agreed with Mr. Howard, that they had a right to call upon Government to appoint a Commission to inquire into the whole matter. If such a course were requisite in the case of Scotland, it was still more so in that of England, where the differences of district and population were even greater than in Scotland. They had been told over and over again that the construction of railways had done away with the through traffic of the country. It had not done away with the through traffic of the country—it had only diverted it. There was an immense amount of traffic still going on from town to town. They saw an immense number of commercial men with enormously heavy loads of goods following a pair of horses; and in many districts there had been not only a diversion, but a large increase of traffic. In the county of Hereford, the income from turnpike tolls had increased six per cent. per annum since the full development of the railway system in that county. They must, therefore, expect an annual increase in the expenditure for the maintenance of the roads; and, as those roads were great national conveniences, they should be treated as such, and the nation at large should contribute to their repair.

Mr. A. **Crosskill** (Beverley) said although they might not all concur in the conclusions of Sir George Jenkinson, yet he thought it must be the unanimous feeling of the Club that the hon. baronet was perfectly right in contending that the question of turnpike-trusts ought to be dealt with in a comprehensive manner (Hear, hear); and that whatever might be the best course, nothing could be worse than to amend an Act here and tinker one there, instead of aiming at a general improvement of the whole system. He thought he gathered from Sir George Jenkinson that his two main propositions were that the future maintenance of the roads should be provided for out of the county rates, and that the existing debts should be paid off by means of a temporary charge on the Consolidated Fund. As to the question of providing for the maintenance of the roads by a county rate, he had no wish to enter into that before a body of farmers, who were much better qualified to deal with such a subject than he was; but he would just make this remark, that they had heard a great deal in that Club about the farmers having to pay county rates and the magistrates to spend them (Hear, hear); and that if anything were done which would tend largely to augment the county rates, farmers would require to have a much greater voice in the expenditure of the money than they had had hitherto (cheers). As to the other question, that of the trust debts being paid out of the Consolidated Fund, he would observe that that was a very wide question, and one which that Club could not deal with alone. Other people besides farmers paid taxes, and it did not seem to him much to strengthen the case on the part of agriculturists for Sir George Jenkinson to have shown, as he had done, that the farmers, or rather the owners of the land, were in the first instance liable. By asking for a charge out of the Consolidated Fund to pay off these debts, they would have over again the difficulty which was raised in Parliament in the discussions on the cattle-plague; and the hon. member for West Norfolk (Mr. C. S. Read) knew what a very awkward thing it was to ask Parliament for money belonging to the country at large in cases in which the agricultural interest was primarily liable. What Sir George Jenkinson said about troops travelling over the roads and the roads being used for national purposes tended to establish a very good case, and before going to Parliament they must take care to fortify themselves with such arguments: for they would have no small difficulties to encounter in seeking to induce Parliament to grant money out of the national funds for purposes for which the land was legally liable. Under the circumstances, therefore, he thought Mr. Howard was right in saying that before any action was taken in this matter there should be a great deal more consideration. As regarded Sir George's estimate of what was required for the extinction of the trust debts, namely, about £100,000 a-year for twenty years, he must say it appeared to him too small. He had considerable doubt whether if the matter should come before the Chancellor of the Exchequer it would not be found that the claims amounted to a great deal more than the hon. bart. supposed. It was true that the bonds and debts were very much depreciated now; but they would, he believed, rise very much in value if there was a prospect of their being paid out of the national funds. All this tended to show that the matter required a great deal more consideration than it had yet received. As to their mode of inquiry, he agreed with Mr. Trethewy that they should not ask for a Royal Commission, but should content themselves with asking for a full investigation. He was sure the meeting would be unanimous in thanking Sir George Jenkinson for having introduced the subject with so much ability. It was a subject of great importance to all concerned, whether farmers or residents in towns, and further investigations at the hands of the authorities must tend to benefit all concerned.

The Rev. E. **Smythies** (Hathern Rectory, Loughborough,) said: As the discussion had proceeded he had been struck with the cropping up more and more of the question of the future maintenance of the roads. No proposition, he apprehended, was more incontestable than that every member of a civilized community, every man, woman, and child, was interested in the making and maintenance of good roads; and if that were the case, all classes, and not merely the owners and occupiers of land, should be willing to share the burden of repairing the roads. Hence, when Sir George Jenkinson proposed that the future maintenance of roads should be provided for by a county rate, a very small amendment would, in his opinion, meet the case, and secure general concurrence, namely: "That the rate should be a county and a borough one, so that the whole community would contribute to the maintenance of good roads" (Hear, hear). Let him mention one illustration of the argument that the burden ought to fall upon towns as well as upon agricultural districts. He would suppose the strongest case that could be imagined in favour of the opposite view—the case of a man who had lived in a town all his life, and who had been bed-ridden and absolutely confined to the house, having hardly ever crossed his threshold. Well, still he lived, and therefore consumed the necessaries of life, and every loaf of bread, and every pound of butter and joint of meat he had—in short every necessary of life—was brought to that man along country roads, and he was, therefore, benefited by the roads, and clearly ought to contribute towards their due maintenance. As to the suggestion that they should look to the Consolidated Fund, he must say he thought the temper the House of Commons had shown on that subject precluded a hope that any application for that purpose would be successful. On the other hand, the tax on wheels and on beasts of burden was quite inadequate to meet the justice of the case; and he repeated that in his opinion the best system would be one under which all the members of the community would contribute according to their means. He thought that if Sir George Jenkinson would so modify his propositions as to declare that the burden of maintaining public roads should be spread over the whole community, it would be likely to meet with the concurrence, not merely of that club, but of the country at large.

Mr. C. S. Read, M.P., said Sir George Jenkinson put this fair question, "Why should not the Government liquidate the existing debts?" The only answer he could give to that question was, Because they won't (Hear, hear, and laughter). Ever since he was born, the tendency of legislative measures had been to put fresh burdens upon land, and from the present temper of the House of Commons he doubted whether they were inclined to alleviate those burdens (Hear, hear). The suggestion of a royal commission for further inquiry into the road system was very important; but he would add this, that the inquiry ought to be immediate (Hear, hear). Every year there came a driblet of beggarly little Acts; every year some fresh injustice was perpetrated, and some unfortunate parish was saddled with what, in his opinion, it ought not to bear. They should not, of course, talk too much of their own counties, and yet he must talk of his own for a moment. In Norfolk they had very few tolls and very good roads, and they had only £18,000 of debt on the whole. Their tolls for a horse-and-cart varied from 3d. to 1½d., and on the previous Saturday they passed a resolution to the effect that although tolls ought to be abolished, it was far better to maintain small tolls than to throw the maintenance of the roads upon poor parishes. The farmers of Norfolk were like those of Essex. They doubted the value of district surveyors, and they still stuck to the old parochial system; and he would just say this, that although it might be a very good plan for improving old and making new roads by having district surveyors, yet, as long as the owners of property did not contribute anything towards improvements, the less they would have to do with them the better. When he lived in South Wales there was a great row with the Rebecca rioters. After that the Government took all the trusts which existed in a county, made one trust of them, and paid the surveyors, and he believed the roads had been more cheaply and better managed than when they were in so many trusts. In Ireland the turnpikes were some time ago abolished, and all the roads were put under one authority, and, he believed, the general rate was something like 9d. in the pound, which might be very well for some persons who lived in mining districts, but which to agricultural ears sounded very like bankruptcy. In conclusion he remarked, that as the poor had been made chargeable on the common fund of the Union, so in his opinion should the roads be repaired by Union rather than parochial rates (Hear, hear).

Mr. W. Eve (London) would throw it out as a suggestion, that the turnpike gates should be retained, and the management be handed over to the Highway Board. It appeared to him that, in that way a great deal of expense now incurred would be avoided, and that which was saved might go towards maintaining the roads. As to anything from the Consolidated Fund, he considered the last speaker had quite disposed of that question (Hear, hear). He did not suppose that any one who knew what was the disposition of Parliament anticipated anything of that kind. He thought the only way of effecting the object was, by adopting the principle of making those who used the roads pay, to a certain extent, for their maintenance.

Mr. T. Horley (The Fosse, Leamington,) said his own experience was not much in favour of increasing the power of the Highway Board. The amount paid by these boards for officers' salaries and law expenses is an equal percentage to the same charges for the maintenance of turnpike-roads, and he thought that more power should be placed in the hands of those who contributed. He agreed with previous speakers, that this was a subject which required further inquiry, and that inquiry should be immediate. One great object to be aimed at was, that all who benefited by the roads should bear a fair proportion of the expenses. He could not help adding that it was a remarkable fact, that while the aggregate of the incomes which paid income-tax was £330,000,000, only £163,000,000 of that amount contributed to the county and poor-rates.

Mr. A. Pell (Hazelbeach, Northampton) said he had come there rather with the view of learning than speaking. As regarded the amendment of Mr. Howard, seeing that it implied delay, he could not very readily assent to it. He understood Mr. Howard's proposal to be that they should hold their hands, and not express themselves definitely until there had been further inquiry through the medium of a Royal Commission. Now what could be the use of further inquiry? In 1864 a committee of the House of Commons sat to consider this matter for twelve days. The opinions which it expressed were to be found in the Report, and he did not think there was any necessity for a further inquiry of the same kind. He had gone through the Report himself with some care, and he would draw the attention of the Club to one or two facts which he had gathered from it. The number of trusts mentioned by Sir George Jenkinson as now existing was 1,093. But in order to draw from those figures some practical conclusion, they must know how many miles those trusts really covered. He should perhaps startle some present when he stated that there was on the average one trust for every fifteen miles, and for each of those trusts there must be at least three officers—namely, a surveyor, a treasurer, and a manager. That was a broad fact. It had been suggested by Sir George Jenkinson that they should get rid of this difficulty by launching into another—the amalgamation of turnpike-trusts with highway districts. This he advocated on the score of economy. But what did he find in relation to that point? Why that while the cost of the establishment charges of turnpike-trusts was 11 per cent., that of the corresponding charges of the district highways was £10 18s. 4d. per cent., which was certainly very nearly 11 per cent.; so that he did not see what they were to get by the proposed change as regarded economy. If the management of turnpike-trusts was to be transferred to highway-boards, there must be a much wider area than was usual now. They all knew as human beings that local influence made it very likely that bad materials would be preferred to good ones if a neighbour had to be served. He should not like as an humble individual to commit himself to any resolution which went to the extent of abandoning toll-gates and adopting a uniform system of highway rates, because he did not believe that would be for the benefit either of farmers or of landowners. There was one thing which was clear to his mind—namely, that the consolidation of trusts was desirable in point of economy. If it were intended to economise officers who had care of the roads, it was a matter still of grave doubt whether the toll should not be kept up to meet the debt. With a consolidation of trusts, and a toll kept up to meet the debt, there might be something like economy of management. But, after all, there remained the great difficulty—they had been talking only of the saddle, the horse was the repair of the roads. It was not for gentlemen who professed to represent farmers and landowners to suggest that the cost of repairs should come solely out of a county rate, it not being the agricultural interest only who used the roads. There was an analogous instance in the case of the militia. Boroughs were rated for the militia in proportion to their population, and he saw no reason why the principle and machinery of that system should not be extended to the case of roads. Nothing could be more equitable, he thought, than that boroughs and large towns should contribute in proportion to their population. He had heard it objected that the inhabitants of towns had to keep up their pavement; but that was, he supposed, because their shoes were thin, and because they wished to communicate with their neighbours (laughter). At all events, pavement was laid solely for their own convenience. For himself, he could declare that he would rather drive over the Bedford or Norfolk gravel than over the best-paved street in the kingdom.

The CHAIRMAN said that three resolutions and an amendment having been placed in his hands, he wished to observe that for some years it had not been customary at the meetings of that club to pass any resolutions; adding that perhaps Sir George Jenkinson was not aware of the fact.

Sir GEORGE JENKINSON said he had merely put the resolutions before the meeting as summarising his ideas; he had no wish to have them put.

The SECRETARY, Mr. Corbet, confirmed the Chairman's statement; and added that he believed the members generally would not approve of any revival of the former practice of passing a resolution at the end of each discussion, as it would commit them definitely to opinions of which they might not approve.

The resolutions and amendment were then withdrawn.

Sir GEORGE JENKINSON then proceeded to reply. He commenced by reiterating that he had not at all desired that the resolutions which he had read as embodying his views should be actually adopted. With regard to what had been said about the maintenance of turnpike-roads in future by means of county-rates, he reminded the meeting that at the outset he stated that that was his first proposition at the court of Quarter Sessions in Gloucestershire, but that his views had been modified to a considerable extent by the discussions which had since taken place in various parts of the country; adding that the third resolution, which involved the very essence of the question, contained not a word about a county-rate, but intimated that the question should be left to a committee of the House of Commons. In reply to Mr. Brown's question, he had to say the expenditure on turnpike-roads in England was £1,064,000; less the interest paid, £138,000; leaving a net expenditure of £820,000. It was estimated that the above, with the cost of keeping collectors and the profits gained by the toll lessees, would amount to upwards of £1,200,000, all of which was paid by tolls. In considering this matter it should be borne in mind that it was not left to them to consider whether trusts should be abolished or the parishes take upon themselves the maintenance of the roads. They had no option in the matter. That the trusts must expire as they became free from debt was clearly shown by the circular from the Home Office. The parishes could not escape from liability, and let them urge upon the Government that whatever might be done, the change should be simultaneous and not partial. As regarded the composition of highway boards, he must remark that there were four or five farmers for one magistrate.

On the motion of Mr. H. TRETHEWY, seconded by Mr. DUCKHAM, a vote of thanks was given to Sir George Jenkinson for his introduction, and a similar compliment having been paid to the Chairman, the proceedings terminated.

Major Wilson, of Stowlangtoft, Bury St. Edmunds, wishing to improve the breed of riding and cart horses in West-Suffolk, has purchased the thoroughbred stallion Marsh Heron, by Marsyas, out of Mrs. Fowler, by Heron, of Mr. Blenkiron; and the prize yearling Suffolk entire colt at the late Bury Meeting, of Mr. Sheppard, of Campsey Ash.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Monthly Council : *Wednesday, February* 6th, 1867. Present, Mr. Thompson, President, in the Chair, Earl Cathcart, the Earl of Powis, the Earl of Shrewsbury and Talbot, Lord Berners, Lord Chesham, Lord Tredegar, Major-General the Hon. A. N. Hood, Sir Massey Lopes, Bart., M.P., Sir A. K. Macdonald, Bart., Sir T. Western, Bart., M.P., Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Davies, Mr. Druce, Mr. Brandreth Gibbs, Mr. Holland, M.P.,, Mr. Hornsby, Colonel Kingscote, M.P.; Mr. Milward, Mr. Pain, Mr. Randell, Mr. Read, M.P., Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. R. Smith, Mr. Torr, Major Wilson, Mr. Jocob Wilson, Mr. Frere, and Dr. Voelcker.

The following New Members were elected :—

Clarke, John, The Roos, Saffron Walden
Hall-Dare, Robert Westley, Newtownbarry House, Ireland
Harrison, Daniel, Kendal
Kingsbury, E. W., 38, Bryanston-street, London, W.
Leamon, Robert, Whitwell, Reepham, Norfolk
Marshall, William Francis, Branston, Lincoln
Martin, James, Wainfleet, Lincolnshire
Miles, Joseph Trueman, Husband's Bosworth, Rugby
Nixey, Wm. George, Upton Court Farm, Slough
Oldfield, Edward, Fouldon, Northwold, Brandon
Rammell, Wm. Lake, Sturry Court, Canterbury
Raynbird, William, Hengrave, Bury St. Edmund's
Rivington, Harry, College Farm, Cirencester
Rust, Edward, Clevedon College, Northampton
Willson, Thomas, Knaptoft Hall, Rugby.

On the motion of the President, seconded by Major-General the Hon. A. N. Hood, his Grace the Duke of Devonshire was unanimously elected a Member of Council, in the room of Sir Edward Kerrison, elected a Vice-President.

Finances.—Major-General the Hon. A. N. Hood, Chairman of the Finance Committee, presented the Report, from which it appeared that the Secretary's receipts during the past two months had been examined by the Committee and by Messrs. Quilter, Ball, & Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on January 31st was £1,446 3s. 10d. The balance-sheet for the quarter ended December 31st, 1866, and the statement of subscriptions and arrears, were laid upon the table; the amount of arrears then due being £1,293. Two hundred and three members have given notice during the past year of their withdrawal from the Society.

Journal.—Mr. Thompson, chairman, reported that in consequence of the unfavourable character of the autumn and winter, the inspection of steam cultivation has been so much delayed that it will not be possible to have the reports ready for insertion in the next Journal, if published in February. The committee recommended that the weekly councils before Easter, at which there shall be discussions or lectures, shall be Wednesday, the 27th of February ; Wednesday, 20th of March ; and Wednesday, 10th of April ; and that Professor Simonds be requested to open the discussion on the 27th of February by reading a paper "On some of the Causes which produce Disarrangement of the Digestive Organs in Young Sheep." This report was adopted.

Bury St. Edmund's Meeting.—The Earl of Powis stated that Mr. Randell and Mr. Torr had been requested to correspond with the local secretary as to details of forage and straw required; also respecting corn for thrashing. The committee recommended that the President be requested to write to the chairman of the Great Eastern Railway Company, to urge the immediate formation of the siding on to the ground, as otherwise the contractor will be much inconvenienced. The Secretary had been directed to write to the bandmasters of the Coldstream Guards and of the Royal Artillery, to inquire as to the probable cost of a military band for the show-yard. Mr. Clay, the local secretary, had reported that Mr. W. N. King, East Barton, Bury St. Edmund's, had been appointed steward of forage. The plan of boxes for ponies, by subdividing the ordinary sheds, was approved. This report was adopted.

Show Yard Contract.—In consequence of the illness of Mr. Pollard, the committee recommended that the contract entered into with him, both for show-yard works and portable buildings, be transferred to Mr. Penny, and an agreement has been accordingly prepared for the due fulfilment by Mr. Penny of those contracts, with security to the amount of £1,000, the only changes being a provision that a portion of the work shall be completed on the 30th of April instead of 31st of May, and that the payments on account be also brought forward.

That the horse ring have a post and single rail fence round it.

That, in order to indicate the several classes of horses and the number of the animals to which premiums have been awarded, as was done at the show of the Yorkshire Agricultural Society, Mr. Parrington, the secretary of that society, be requested to procure a set of numbers for the Royal Society similar to those in use at York last August.

That the secretary apply to Mr. Edgington for a royal standard, to be fixed over the main entrances.

That the seal of the Society be this day affixed to the agreement above referred to.

This report was adopted, and the common seal of the Society was then affixed to the agreement by the secretary.

Steam Cultivation.—Mr. Thompson stated that the Committee have to report that notwithstanding the unfavourable weather the inspection of steam cultivation is nearly completed.

Mr. Howard Reed and his coadjutors, Mr. Hemsley and Mr. Hicken, have inspected 28 farms, at a cost of £225 3s. 5d., and this report is now in the printer's hands.

Mr. J. A. Clarke and his colleagues, Mr. Leeds and Mr. Nicholson, have visited 50 farms, for the sum of £277 10s., and Mr. Coleman, with Mr. Thompson (Badminton), and Mr. Turnbull, have completed one short round of visits, and hope to complete their final one next week.

It is expected that all the reports will be in the Society's hands by the end of this month, and that the cost of this inquiry will not materially exceed £600 irrespective of the reports, which will probably not fall far short of £200 more, against which will have to be placed the ordinary charge for providing an equal number of sheets of matter for the Journal, which would cost fully that sum.

This report was adopted.

Poultry Show.—Major-General the Hon. A. N. Hood reported the recommendation of the Committee that a sum of £209 be devoted to this portion of the prize sheet, which has been prepared by Mr. Baily, of

Mount Street, and adopted with some few alterations. The pens should consist of one cock and one hen, one drake and one duck, or one gander and one goose. The rules should remain the same as on the Chester prize sheet. If birds be intended for sale, the price to be stated on the certificate of entry. A charge of 10 per cent. will be made for all birds sold. The Committee recommended that the pens of the Ipswich Poultry Society be hired if they would adapt a fastening to them.

This report was adopted.

Announcement of the decease of the Marquis of Exeter, K.G., a vice-president of the Society, and of Sir John Villiers Shelley, Bart., a trustee, having been made, notice was given that elections of Governors to fill these vacancies would take place at the Monthly Council in March.

MEETING OF 1868.—The district comprising the counties of Derby, Leicester, Lincoln, Nottingham, and Rutland having been selected, it was resolved that copies of the Country Meeting Queries be sent to the authorities of Derby, Leicester, Lincoln, Nottingham, and of any other town in the district that might apply to the Secretary.

COUNTRY MEETING QUERIES.—Mr. Brandreth Gibbs stated that the Committee recommended that the queries be adapted to the year 1868, and to add "as to making roads up to the entrances &c., if required." To omit the queries "as to rooms for meeting, &c., these not being required." To add a query, "asking if authorities will provide horses and drivers for the trials of implements, the Society paying the men's wages and the keep of the horses;" and to ask for 20 acres of light land instead of 25. To omit all the queries for medium land, and to ask for heavy land to the extent of 100 acres instead of 15, one-half of this to be in clover lea. To insert a query as to the supply of water for the steam cultivators. This report was adopted.

The Council having resolved itself into a Committee on the Cattle Plague, it was resolved that a letter be written to the Privy Council, requesting that the prohibition to import Dutch hay may be made absolute so long as the Cattle Plague exists in Holland.

DEATH OF LORD FEVERSHAM.

We regret to record the death of this nobleman, which took place on Monday, Feb. 11, in London. William Duncombe, Baron Feversham, of Duncombe Park, York, in the peerage of the United Kingdom, was son of Charles, first lord, by his marriage with Lady Charlotte Legge, only daughter of William, second Earl of Dartmouth. He was born 14th Jan., 1798, so that he was in his 69th year. The deceased was educated at Eton, and afterwards proceeded to Christ Church, Oxford. He married, 18th December, 1823, Lady Louisa Stewart, third daughter of George, eighth Earl of Galloway, by whom, who survives his lordship, he leaves issue two sons, the Hon. W. E. Duncombe. M.P., and Captain the Hon. Cecil Duncombe, of the 1st Life Guards; and three daughters, the Hon. Jane, married 11th April, 1849, to the Hon. Laurence Parsons; the Hon. Gertrude, married 27th November, 1849, to Mr. Francis Horatio Fitzroy; and the Hon. Helen, married 18th July, 1855, to Mr. William Becket Denison. Previously to his accession to the peerage, on the death of his father in July, 1841, he represented Yorkshire in the House of Commons from 1826 to 1830. At the general election in 1831 he was an unsuccessful candidate for the county, but was returned for the North Riding in the following year, which he continued to represent till 1841. He voted against the Reform Bill of 1832, and was uniformly in favour of agricultural protection.

The death of Lord Feversham will occasion another vacancy in the Council of the Royal Agricultural Society, of which he was a Trustee, and a very regular member in his attendance at the meetings in Hanover Square. He served the office of President as late as 1864, when he finished his round of duties, very ably discharged, at the Newcastle show. He had also acted as President of the Smithfield Club, the removal of which to Islington he supported not only with his vote, but by taking shares in the Agricultural Hall Company. Lord Feversham was, indeed, very earnest in the encouragement he gave to agriculture, while he was especially famous for his Shorthorn herd, which for some years past has generally stood high on the prize list. He made a few purchases at Lord Ducie's sale, one of which, an Oxford bull-calf for which he gave 300 gs. at a few weeks old, was subsequently the best of the old class at the Chester Meeting; and a very sweet heifer, with which he won at Newcastle, was only just beaten for first at the last Christmas show, having for some peculiar reason never been put to breeding purposes. There is something very substantial as well as well bred in the character of Lord Feversham's Shorthorns, and should they come to the hammer they will no doubt reach a good average, even in these times when very long figures for fancy stock appear to have passed away.

Lord Feversham did a deal of good for the cause to which his tastes inclined, and, though no great speaker, pretty generally took correct views in dealing with the public business of agriculture. He is succeeded by his eldest son, the Hon. William Ernest Duncombe, who was born January 28, 1829, and married August 7, 1851, Mabel Violet, second daughter of the late Right Hon. Sir James Graham, Bart., of Netherby. He was M.P. for East Retford from February, 1852 to 1857, and elected for the North-Riding of Yorkshire in 1859, and was also returned at the last general election after a sharp contest, being second on the poll. He is captain of the Yorkshire Yeomanry (Hussars) Cavalry, and Lieutenant-colonel of the 2nd North-Riding Rifle Volunteers. Like his father, he is a supporter of Lord Derby, but in favour of such a measure of Parliamentary Reform "as would give no undue preponderance to any one class, but would conduce to a fair distribution of political privileges." The present Lord has for some seasons been Master of the Bedale foxhounds, and as a sportsman and a horseman is as distinguished as his father was as an agriculturist.

The death is announced of the Rev. Samuel Smith, M.A., vicar of Lois-Weedon, Northamptonshire, and well known for his work on Lois-Weedon Husbandry, a book founded upon Tull's theory, that has created a deal of discussion. Mr. Smith was the author of some other works, and the brother of Mr. "Tom Smith," as famous as a huntsman as his brother was as a farmer.

THE NEW FARM.

The "New Farm!" Well, we won't, if you wish it, call by this title anymore a place or occupation, the novelty of which will have been worn off in your readers' estimate, but the novelty of which to me, thank Heaven, is ever revirescent—ever exhibiting some new phase of stock or crop experience, various as the light there, at this moment shifting on the deep blue distant landscape. "Records of our Farm" henceforth would you have it? You can suit yourself—only let me know. And, thus, after so many months of silent what?—enjoyment? indolence? industry?—we are, not without a feeling of delight, I must confess it,

> "Once more upon the waters!—yet, once more!
> And the waves bound beneath me as a steed
> That knows his rider! Welcome to their roar.
> Swift be their guidance, wheresoe'er it lead."

It's all very fine—this beautiful quotation from Childe Harold; but the fact is, we are not upon the waters at all (except metaphorically); it's rather that the waters are upon us, and, upon the whole, not doing us unmitigated good. The floods are out, and have been so, off and on, since the choleric Welsh hills sent down their surging torrent of ripped-up old ice raiment and superfluous mud broth. In faith, we could have well spared those everlasting mountains their gift of old clothes; for it's sand mainly, and not a Nile-like deposit of alluvial loam, that they have shipped down to this (the lower) estate.

And right good reason I have personally to be dissatisfied with the dressing. For just a week since, indulging in a matutinal digestive cheroot, there caught my eye the dark form in the distance of a colt lying somewhat more heap-like on the hillside than suited my idea of repose. Hailing the gardener, who was busy with the rhododendron bushes close by, I inquire his opinion. "Heigh!—Hurroo there!" he shouted—with a power of stentorian lungs that I quite envied—by way of awakening the animal rather than replying to his master. And, sure enough, it raised its head thereat, but painfully and appealingly, it struck me. "Him be only sleeping in the sun—I seed 'em ever so many times so. Him be only a gammoning."

However, as I am not wont to be quite so easy in my mind as that, I desire his attendance on a visit to the suspected. It was as my fears augured. We found a pet pony, that had carried the blue riband in a competition of thirty, all broken out into a sweat, and trembling violently, while ever and anon she cast an anxious imploring glance towards her flank. Colic, methinks, or inflammation. "Him be bad, sir," broke in our estimable melon-shaped servitor; "well, I'd never have noticed him." Of course you wouldn't, methought, but didn't say, as he is excellent in his place, and has no charge of the live stock; but why did not the labourer who feeds them notice something wrong? But there's no use talking or reflecting on this point. Of course if he did he wouldn't be a labourer on twelve shillings a week. That's all I have to conclude. However, we stir her, and she rises. We lead her home, and dose her for colic, the symptoms of which presented themselves. But she was a pet, and so we did not trust our private medical treatment, but despatched a messenger for a "vet." of considerable local reputation. He pronounces it "a stoppage," and dealt with her accordingly. She rolled and groaned, and was no way relieved the livelong day. Two faithful fellows sat up the night beside her. At midnight I saw her apparently no better, and as yet not relieved by action of the medicine. At six I get a glad message from the bailiff that the desired movement had taken place, and that the filly was decidedly better. I see her at eight, and find her standing with water running from her mouth. She laid her head affectionately against me, as if to ask "Can you not relieve me?—I do feel so bad." But, after some petting, I had to go, and, on my return at twelve, expecting to see her a trifle brighter, I found her in the box, laid out cold and stiff, and the attendants gone. She had fallen and died almost the moment I had left her. And this was all from her breaking out in a fit of high spirits from her proper pasture to a meadow which, left with a long coating of autumnal grass, had got thickly strewn with this pestilent sand from the river's overflow, and which had lodged heavily on the poor creature's stomach. I did not before know the risk of leaving long grass upon the fields that the waters invade. It seems that it is, however, no unfrequent cause of death in this district, especially in the case of sheep and kine.

But there's no use crying for shed milk—we must make the money up somehow—by cutting off the beer, or the French plums, or the bonnets, or somehow. To change the sad subject, let me remark, as an old tutor, that children cannot be taught the modern languages too soon. French, Italian, and German they should learn almost from infancy, if they are to learn them at all, when the elastic organs of speech can modulate unerringly each syllable, and the ear is quick as accurate in catching sound. But, unfortunately, the fry don't appreciate these advantages, and, moreover, are difficult for foreigners to manage. So, as a last resource parentally, we offer a prize for him or her that shall earliest learn to speak the most French. Even as we write behold a result. A six-year-old pickle, who has been allowed by request to spend an hour in pappy's study, and has been reclining upon the sofa, apparently in a state of brew for some time—an indication, we trust, of future authorship—breaks out at last in a tone of weariness that is intended for our ear, while he would affect that it was not either: "*Ah! cher moi!*"—the obvious translation of which is, "Oh! dear me!" and the only parallel to which we know is the Frenchman's rendering of the Shakesperian "So woebegone"—"*Si triste allez-vous en.*" But here's another anxious youth just come up to report progress—the lad that has the charge of our shorthorns and sheep. He is "consternated" by the daylight vision of a fine fox seen twice yesterday crossing a field, where our earliest Jonas-Webb Down lambs are billeted with their mothers. This comes of living under a gorse-covered hill upon the verge of a forest, which the county hounds don't care to visit. This must be the reynard that I too charitably allowed to pass unchallenged a month since, when stationed at an advanced post in a cover which was being beaten for pheasants.

I was half-inclined to let drive at the red robber when he trotted so confidently and listeningly along the main path, within thirty yards of the keeper's house, and close beneath my lair. "Ah! would you?" "Vulpecide!" &c., &c. Oh! yes, I hear; but if the region be such that hounds cannot hunt it, and your ducks and chickens go, why what then? But we won't discuss it, for we have hunted ourselves, and we know the arguments of old, and have let thus much drop, just for fun, to disturb any chance venatic reader. Upon the snow we could trace the villains close around the house and buildings, and yet we abstained even from dropping a ham-bone in their way—a *bonne bouche* which as certainly promotes their disappearance, as a meal of salt meat will make a monkey gnaw his tail.

But writing of stratagems reminds me that the poachers are about after the pheasants, to be disposed of for breeding purposes, and this obliges an incessant look-out. The most favourite modes of taking them in this district are by catching their necks in a noose—a knot on which prevents its being drawn too tight; or by strewing grain that has been soaked in spirits in their runs, and then arresting them under intoxication; or, the third way, by scattering tick-beans about, each one strung upon a bristle —the effect of which is that the unhappy bird, unable to swallow the berry, owing to the bristles projecting out on each side his beak, falls ultimately, gasping, an exhausted easy prey for the concealed poacher, who then just draws the bean back by the bristle-ends, and has an affrighted but uninjured prize.

Yesterday—blessed day that it was for man, bird, and beast—there were such a number of the hens running coyly about the shrubberies, with a mate or two all gorgeously plumaged in attendance, as though upon the look-out for lodgings. So warm—so deliciously April-like was the air, only wanting the perfume of later spring. The speckled-thrush hopped in and out too, amidst the ivy leaves, and the nuthatch was busy upon the bark of the willow, where they annually breed. Ever and anon a splendid salmon leaped out upon the reach below the house, making one long for the expiration of the current fence month, so gaily glancing back to his dark home, his path being quite visible under the surface by a line of silvery sheen. The bees too awoke, filling the greenhouse with quite a lively sociable buzz of industrious occupation.

Talking of industry, I am reminded that co-operation between employer and employed is the order of the day, as it affects us—the question being, How can it be adopted upon a farm? In two instances it answers certainly well, and I should be glad to learn how the system could be extended further. Being a good deal given to exhibiting at shows, I have found it to my advantage, as Joseph Ady would say, to share the occasional success with those who have the care and keeping of the stock exhibited. Instead, then, of a traditional half-sovereign, I have adopted the plan of insuring the cowman's life, so that he shall receive £150 when he is sixty years of age; while, in the event of his death before that period, his family will reap the benefit at once. I allow him to exhibit—retaining just an ultimate voice—what he pleases, but without waste, as I ascertain for myself from the corn and cake book. The policy premiums annually he must pay from money won as prizes, or, that being insufficient, out of his private pocket. The consequence is that my stock is always in excellent condition, and the prizes taken a good slice.

Another extension of this principle to the affairs of the farm is to make a pig at Christmas a part of the bailiff's wages—the least of the fattening pigs. The obvious consequence of this will be that he takes care that the whole lot are made as big as they can be. And, now, sir, for your story. I shall be much obliged to any gentle reader for a hint as to further use of this belauded system. But having filled my paper with prelude, as our excellent Chancellor of the Exchequer is said to have done his speech last Monday night, I am, for the present, your obedient servant, VIGIL.

THE AGRICULTURE OF SOUTH AUSTRALIA.

Of the several Australian colonies, that of South Australia is the one, which from its agricultural progress and pastoral extension, possesses most interest just now to British readers. Large as its mining industries are, they are overshadowed by the operations of its farmers and stock-breeders. Its wheat-produce is making such strides that it is not only able to supply its neighbours, but to send flour far a-field to more distant countries. Although the colony took no part in the Paris Exhibition of 1855, where New South Wales, Victoria, Tasmania, and New Zealand were represented, it has now made a large grant, and sent off a very excellent collection for Paris this year. In connection with this display we have already received the special catalogue of its exhibits, and the Statistical Register of the colony, which has been drawn up with the view to show its present and past condition.

In the latter document, the statistical returns extend back for ten years, and in this period we find that the combined import and export trade of the colony has doubled, being now six instead of three millions; and about half of the external trade is carried on with the mother-country. While agricultural produce exported forms over 41 per cent, and wool about 31 per cent. of the total exports, minerals reach to but 24 per cent.

Although the productions of the mines of the colony are annually increasing in value, the rate of progression has been far less rapid than that of either agriculture or wool-growing, both of which have advanced during the past ten years with equal strides, subject to occasional temporary retardment, at one period affecting the farmer, at another the squatter.

The quantity of breadstuffs shipped in 1865 was within a few tons the same as in 1864, namely 60,000 tons; it was worth, however, two-thirds more money. The adjoining colonies of Victoria and New South Wales took the greater portion, owing to a second failure in their crops. During the last five years the shipments of wheat and flour were double those of the preceding five, and a like increase appears in the average annual exports. The exports of 1865 however, were nearly threefold those of 1856; and whilst the shipments of cereals advanced from 23,908 tons in 1856 to 26,476 tons in 1860, during the next five years they advanced to 60,513 tons, and that with harvest below the average.

Four acres of tilled land seems to be the rate per head for each individual of the population, or twelve acres for every male of fourteen years of age and upwards. Two and a-half acres of wheat are grown to each person in the community. The average yield of the last harvest was, however, less than in any preceding season, only amounting to 8 bushels 44 lbs. per acre. During the previous seven years the lowest yield recorded was 9 bushels 38lbs. in 1860, whilst the average for the whole period was 12 bushels.

The live-stock statistics exhibit but too clearly the losses the pastoral interest and the colony have sustained through the long continuance of drought. This is the first occasion on which a diminution in the number of sheep depastured has been recorded; and although the number of cattle has been lessening year by year, the falling-off during the past season was unprecedented. Nine years ago the colony depastured twice the number of cattle that it now does: then they counted three head of cattle for each individual of the population; now, but one. In one year the number has been reduced from 204,892 head to 158,057.

The aggregate number of sheep returned is 3,780,000, as against 4,106,230 in the previous year, or nearly nine per cent. less. Instead of exporting large numbers of sheep, as in several previous years, South Australia had in 1865 to purchase largely in the neighbouring colonies, and the market has been regularly supplied for some years with fat cattle belonging to the adjoining colonies from the Darling. In 1864, 186,526 sheep were exported more than imported; but in 1865 and 1866 the balance was against the colony by about 40,000 sheep each year. In horses there is an increase in the returns of about 10,000 over the previous year, the number in the colony being 74,000. There is a small increase in goats and pigs, and a much larger number of poultry returned.

During 1865 the number of bales of wool shipped was 56,182, showing an increase of 5,236 bales on the previous year's shipments, the total weight being about 19 million pounds, as compared with 17½ in 1864, and 16½ in 1863. This increase is, however, occasioned by the large quantity of wool from the other colonies shipped *via* Adelaide. As the wool season is at its height in December and January, the export returns made up to the close of the year do not show the actual weight of any given clip. The following figures, made up to the end of June of each year, show more clearly the average clip of the last four seasons—1863 14¼ million lbs., 1864 16,836,000 lbs., 1865 17,500,000 lbs., 1866 16,124,000 lbs. The disastrous effects of the prolonged drought in the northern part of the colony are apparent in the falling off of the shipments. Looking back upon the rapid progress making in the growth of wool antecedent to the drought, the retrogression shown in these figures indicates but a portion of the loss the community has sustained under this visitation. Notwithstanding the sudden check in the quantity of wool grown, the shipments of 1865 were, both in quantity and value, double what they were ten years ago. Whereas in 1856 the colony grew 8,236,221 lbs. of wool, of the declared value of £412,163, in 1865 it produced 16,270,000 lbs., worth £821,482. When so much has been done in so short a period heretofore, it may be expected that under more auspicious circumstances than have lately existed, the progress of a class producing nearly one third of the staple exports will be again recorded. The contributions of South Australian wool to the Paris Exhibition comprise 8 bales, which will form part of the combined Australasian wool trophy; and 25 fine fleeces in the grease and washed: some of the Lincoln ewe fleeces weigh 16 and 17 lbs. gross, and the merino ram 9 and 11 lbs.

A very large quantity of wine has been sent to the Paris Exhibition, about 51 dozen and 9 quarter casks by 18 exhibitors, evidencing that much progress has been made in the colony in wine making. The latest statistics give 6,629 acres as devoted to vineyards, with 7½ million vines planted, of which 5¼ million are in bearing: 840,000 gallons of wine were made in the colony last year, and 31,707 cwt. of grapes sold for eating &c.

Judging from the list of exhibitors on their way to Paris, South Australia is likely to be very fairly represented on this, her first appearance in French International Exhibitions.

ASSOCIATING WITH FARMERS AND MARKETS.—The Bishop of Rochester's prudery did not stop with his first amusing charge. Not three years later he went in for a new act of obeisance to the Evangelical Mrs. Grundy, by inhibiting a worthy clergyman in his own diocese, a personal friend, and the son of a friend, from preaching or officiating in it—this gentleman had at the time no "cure of souls"—on the ground that he was engaged in practical farming as the agent of a friend. The clergyman in question, a Mr. Davies, had been ordered by his physicians, on account of weak health, to engage in some out-door pursuit like farming, and to give up his regular clerical duty. This he had done, but had continued to officiate occasionally for brother-clergymen by whom he was much valued. The Bishop of Rochester, who has always been strongly in favour of ecclesiastical espionage—as Archdeacon of Winchester he pressed it upon his churchwardens, and got warned in reply that if they "presented" supposed moral offences to their Archdeacon they might probably be liable to an action for libel—was informed by the rural deans, whom he asked to report to him on anything irregular, that Mr. Davies farmed land for a friend of his, Mr. Disney. There was nothing else whatever against Mr. Davies' character. He seems to have been held in the highest esteem by his brother-clergymen, and to have lent ideas, in some of his many times of dearth, even to his bishop. If he had not occupied his enforced leisure at all, the Bishop would have approved of his idleness—at least if he had continued to shave. But as he filled up his leisure by useful work for which he was eminently fit and fairly remunerated, the Bishop declared him, in delightfully Gampish English, unfit to preach or pray. "It appears to be generally known and remarked upon," said Dr. Wigram, "that you are engaged in the management of land, holding a farm also yourself, *and of necessity associating with farmers and markets* far more than is usual in the case of clergymen, or than is proper for them, according to the best judgment I can form." And Mr. Davies was silenced. The Bishop himself, it was said at the time, farmed 300 acres of glebe at Danbury; but then he did not "associate with markets more than is usual with clergymen, or than is proper for them," however much or little that may be. The Bishop owned that "the best judgment he could form" took account of "the feelings of society in these parts in respect of the ministerial office," which were not favourable to clergymen so usefully employed as in farming. This extraordinary piece of ecclesiastical prudery was the more odd in Dr. Wigram because, as Archdeacon of Winchester, he had pointed out, in his own peculiar style, to the farmers of his archdeacoury that "there was an agriculturist once" who had proved that a pious and successful farmer could do more for his nation than any military precautions: "He was rich in cattle, in silver, and in gold; he had flocks and herds, and his substance was so great that the land could not bear them—he was forced to move his place; he had herdsmen and shepherds, with which no man's in this country are fit to be named; and, besides, he had above 300 trained servants born in his house, who were ready to maintain his right. That man was honoured by his fellows, while he held his possessions for the good of the people and the glory of God. And the Lord blessed him above all, because he commanded his children and his household after him to do justice and judgment, and to keep the way of the Lord. That pattern of masters who lived by agriculture was thus made a blessing to mankind; his name has always been held in sacred honour and ever shall be, for his titles are above all earthly dignities, while believers acknowledge him as 'the father of the faithful,' and 'the friend of God.'" How did Abraham's farming differ from that of Mr. Davies? Apparently in being rather more of grazing than farming, rather more successful in result, and not involving quite so much "association with markets," probably not "more than was proper" for him. Or perhaps "the feelings of society in those parts in respect of the" patriarchal offices were less opposed to remunerative grazing than they are in Essex.—*Pall Mall Gazette.*

TABLE SHOWING WHAT THE YIELD OF THE CROPS OF 1866
BEEN AN

	WHEAT.			BARLEY.		
	Acres grown in 1866.	10 years' average, ending 1861, in Bushels.	Average Gross Yield in Bushels.	Acres grown in 1866.	10 years' average, ending 1861, in Bushels.	Average Gross Yield in Bushels.
BEDFORD	48,306	28½	1,376,721	29,989	35½	1,064,610
BERKS	61,103	33½	2,046,950	39,911	41¾	1,666,284
BUCKINGHAM	53,661	28½	1,529,338	31,220	37¾	1,178,555
CAMBRIDGE	131,217	32¼	4,231,748	54,918	41	2,251,638
CHESTER	33,368	29	967,672	6,164	34½	213,158
CORNWALL	46,815	23¾	1,111,855	46,535	31¾	1,477,486
CUMBERLAND *	23,979	29	695,391	11,372	37¾	429,293
DERBY	32,572	29	973,588	14,497	40½	587,128
DEVON	111,768	22¼	2,486,838	75,312	31¾	2,391,156
DORSET	46,037	29¾	1,369,600	38,257	38	1,453,766
DURHAM	42,800	25¼	1,080,700	12,990	33	428,670
ESSEX	181,062	31	5,612,922	109,636	40	4,385,440
GLOUCESTER	88,241	27½	2,426,627	41,614	34½	1,435,683
HANTS	110,824	27¾	3,075,366	68,033	36½	2,483,204
HEREFORD	59,490	25¼	1,502,122	21,192	32	678,144
HERTFORD	58,868	28	1,648,304	46,480	35½	1,650,040
HUNTINGDON	43,406	29	1,258,774	21,083	40¼	848,591
KENT	104,173	33	3,437,709	41,422	40½	1,677,591
LANCASTER	38,043	34¼	1,302,973	7,448	39	290,472
LEICESTER	43,679	29¾	1,299,451	32,004	37¾	1,208,151
LINCOLN	294,014	31	9,114,434	141,001	39½	5,569,539
MIDDLESEX	9,654	30	289,620	2,222	37½	83,325
MONMOUTH *	19,796	29	574,084	12,150	37¾	458,662
NORFOLK	189,398	33½	6,344,833	186,925	42¾	7,991,043
NORTHAMPTON	70,726	32½	2,298,595	54,469	44	2,396,636
NORTHUMBERLAND	36,814	26	957,164	32,159	35¾	1,149,684
NOTTINGHAM	67,628	29¾	2,011,933	49,134	41¾	2,051,344
OXFORD	57,357	31	1,778,067	53,339	39½	2,106,890
RUTLAND	8,870	33	292,710	9,414	43¼	407,155
SALOP	80,326	24¾	1,988,068	52,197	29	1,513,713
SOMERSET	69,012	29	2,001,348	33,358	36	1,200,888
STAFFORD	52,922	28½	1,508,277	30,058	35¾	1,074,573
SUFFOLK	178,021	28¾	5,118,103	138,496	35½	4,916,608
SURREY	42,083	27	1,136,241	18,865	35¾	674,423
SUSSEX	97,874	29¾	2,911,751	24,946	41¾	1,041,495
WARWICK	72,956	30	2,188,680	29,834	39½	1,178,443
WESTMORELAND	2,194	28¾	63,070	2,628	37	97,236
WILTS	96,800	28¾	2,783,000	64,868	36½	2,367,682
WORCESTER	64,781	29¼	1,894,844	20,096	39¼	820,168
YORK	290,793	29½	8,578,393	170,551	39½	6,736,764
Total	3,161,431		93,267,864	1,877,387		71,635,331
Quarters			11,658,483			8,954,416

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* We could not get the averages of either Cumberland or Monmouth, but have calculated the
Barley, 37¾ ; Oats, 46½ ;

WOULD HAVE BEEN IN ENGLAND IF THE YIELD HAD AVERAGE ONE.

OATS.			BEANS.			PEAS.		
Acres grown in 1866.	10 years' average, ending 1861, in Bushels.	Average Gross Yield in Bushels.	Acres grown in 1866.	10 years' average, ending 1861, in Bushels.	Average Gross Yield in Bushels.	Acres grown in 1866.	10 years' average, ending 1861, in Bushels.	Average Gross Yield in Bushels.
10,526	47¾	502,616	18,682	32¼	602,494	5,301	29¼	155,054
25,259	56	1,414,504	14,114	36	508,104	5,655	33½	189,442
23,842	48½	1,156,337	17,727	30	531,810	5,942	29½	175,289
42,605	59½	2,534,997	24,646	31	764,026	7,989	30¼	241,667
46,260	41¾	1,931,355	8,752	37¼	326,014	1,623	30	48,690
42,975	37¾	1,622,306	103	30	3,090	34	30	1,020
71,870	46½	3,341,955	447	32½	14,527	648	30	19,440
29,369	48	1,409,712	1,701	35	59,675	3,176	30¼	96,074
82,023	37	3,034,851	893	30	26,790	1,044	30	31,320
22,781	45	1,025,145	3,337	28¾	95,938	2,455	29	71,195
45,942	41	1,883,622	3,775	32	120,800	4,411	23	101,453
45,504	51	2,320,704	43,778	32¼	1,411,840	24,884	29½	734,078
17,030	40¾	693,972	16,620	33	548,460	7,009	31	217,279
65,651	47½	3,118,422	6,193	30½	188,886	7,240	31	224,440
12,205	31¼	381,406	6,770	33	223,410	6,017	27½	165,467
24,977	44¼	1,105,232	9,232	31½	290,808	6,676	30	200,280
10,889	54¼	590,728	13,483	31½	424,714	4,935	31¼	154,219
56,080	53	2,972,240	23,888	29¾	710,668	18,201	29	527,829
55,617	40	2,224,680	5,598	37½	209,923	349	30	10,470
20,663	47	971,161	12,121	35	424,235	7,210	33½	241,535
101,399	54½	5,526,245	27,667	32¾	906,093	27,165	30	814,950
5,745	57¼	328,901	1,466	34¾	50,943	1,469	32	47,008
7,904	46½	367,536	408	32½	13,260	1,143	30	34,290
34,227	55½	1,899,598	13,364	34	454,376	16,871	32½	548,307
19,824	53¾	1,065,540	25,551	35½	907,060	9,350	34¾	324,912
72,636	40¾	2,959,917	6,419	28¼	181,337	5,428	25¼	137,057
17,603	52	915,356	12,148	36½	443,402	9,405	34¼	322,121
21,248	49¾	1,057,088	16,986	35	594,510	7,134	32½	231,855
3,246	53	172,038	1,849	37	68,413	1,336	35¼	47,094
24,816	31½	781,704	3,550	27	95,850	9,218	23	212,014
23,643	44	1,040,292	13,471	32¾	441,174	1,888	28¾	54,280
30,325	40	1,213,000	4,113	35½	146,011	6,690	36¾	245,857
19,030	47	894,410	37,405	31	1,159,555	25,503	30¾	784,216
26,925	42½	1,144,312	2,966	29½	87,497	6,823	30½	208,101
63,325	51	3,229,575	8,548	31	264,988	12,303	29	356,787
13,621	49	667,429	22,503	34	765,102	12,327	31	382,137
17,042	34¾	592,210	68	30	2,040	114	20	2,280
33,214	47¼	1,569,361	12,309	31½	387,733	6,186	32	197,952
7,293	44¼	322,715	18,496	29¾	546,256	8,279	29¾	246,299
208,856	51	10,651,656	31,439	27½	864,572	24,775	28	693,700
1,503,990		70,634,828	492,586		15,866,384	314,206		9,497,458
		8,829,353			1,983,298			1,187,182

yield at the average of the other thirty-eight counties, which is as follows:—Wheat, 29 bushels; Beans, 32½; Peas, 30.

The tabular statement on pages 250 and 251, is based on the Government Agricultural Statistics lately issued, and brought to a practical purpose by a report which we procured, in 1861, from upwards of five hundred correspondents in different parts of the kingdom. The Government return gives the number of acres under wheat, barley, oats, peas and beans, in England; the information being collected in 1866. Our return referred to the average produce per acre of these cereals for ten years, ending 1861, which may be considered sufficiently correct to form a basis, coupled with further information, to arrive at as correct an estimate of the aggregate produce of any given harvest as, under the circumstances, can be obtained. The following return from five counties, taken from the *Mark Lane Express* of the 17th of February, 1862, will explain the manner in which the averages are arrived at:—

1862.	Wheat.	Barley.	Oats.	Beans.	Peas.
ESSEX.					
Chelmsford	32	40	56	40	32
Ditto	30	40	44	36	—
Coggeshall	28	44	56	32	24
Colchester	32	40	40	30	32
Dunmow	36	44	56	28	32
Kelvedon	24	32	40	24	24
Maldon	30	40	48	28	24
Manningtree	36	40	64	32	32
Ockendon	32	44	56	32	30
Roydon	32	40	52	32	32
Writtle	30	36	48	40	32
Gross	342	440	560	354	294
Average	31	40	51	32¼	29½
KENT.					
Ashford	36	36	48	36	32
Benenden	32	—	40	24	24
Boughton Blean	36	44	64	36	32
Brabourne	32	32	56	32	24
Elham	24	32	48	24	32
Faversham	30	40	52	28	24
Gravesend	38	46	60	28	38
Maidstone	32	48	56	32	32
Ridgway	36	48	56	28	28
Sandwich	26	32	40	24	24
Seven Oaks	32	40	60	34	26
Wingham	40	48	56	32	32
Gross	394	446	636	358	348
Average	33	40½	53	29¾	29
LINCOLNSHIRE.					
Bardney	24	32	40	32	24
Belvoir Vale	28	32	44	—	—
Boston	36	40	60	32	28
Candlesby	32	44	56	32	32
Colsterworth	24	40	48	—	—
Grantham	32	40	48	32	—
Long Sutton	32	40	72	36	32
Market Deeping	32	46	64	32	32
Moulton	32	40	64	36	32
Riseholme	32	40	56	24	32
Spalding	40	—	56	40	32
Stamford	32	40	52	32	—
Sutton Bridge	32	40	56	32	32
Thurlby Grange	32	40	48	24	32
West Theddlethorpe	24	40	—	40	24
Gross	464	554	764	424	332
Average	31	39½	54½	32¾	30

1862.	Wheat.	Barley.	Oats.	Beans.	Peas.
OXFORDSHIRE.					
Bicester	32	40	56	32	32
Chawley	36	44	48	32	32
Cutteslowe	28	32	36	32	24
Eynsham	22	40	48	34	30
Farnborough	32	40	56	40	32
Great Tew	28	32	44	30	30
Hampton Gay	32	40	48	40	32
Henley-on-Thames	28	36	44	—	28
Radcot	28	36	40	32	32
Shipton	32	38	44	36	36
Steeple Aston	40	48	64	36	48
Swyncombe	34	48	68	40	34
Gross	372	474	596	384	390
Average	31	39½	49¾	35	32½
WILTSHIRE.					
Aldbourne	24	36	48	—	—
Badminton	28	32	40	32	36
Baydon	30	40	48	—	32
Broad Hinton	32	36	64	32	32
Chippenham	24	32	36	32	32
Lanhill	28	40	44	32	32
Marlborough	32	36	52	28	28
Pewsey	28	40	52	32	32
Salisbury	32	40	56	—	—
Swindon	32	36	40	32	3
Warminster	24	32	40	32	3
Gross	314	400	520	252	288
Average	28¾	36½	47¼	31½	32

In the absence of official statistical information (with the exception of Ireland), respecting the agricultural produce of the United Kingdom, it has been our endeavour, from year to year, at great expense and trouble, to collect from intelligent and trustworthy agriculturists, in all parts of the country, such facts relating to the yield of the crops as have enabled us to arrive at something like an accurate estimate, and the deficiency or otherwise that might exist in the aggregate yield. With regard to wheat, we have hitherto based our estimate of the aggregate consumption on what is considered to be that of each individual, which we average at one sack of flour, or six bushels of wheat per annum. Taking the population of the United Kingdom, therefore, at thirty millions, this will give an aggregate of twenty-two and a-half million quarters of wheat, or thirty million sacks of flour. The further requirements of the country, over and above what the crop produces, are supplied by importations. Thus, we have always estimated an average crop of wheat of the whole kingdom at from fifteen to sixteen million quarters, and the importations have been regulated by the deficiency under or the excess above that quantity.

Not only is our estimate of the consumption and production, in the main, justified by the result derived from these tables, but the value of our annual returns of the harvests is proved beyond a doubt, and their accuracy may be safely depended on by the miller and the merchant in arranging their operations for the year, especially now that the Government return gives the breadth of land under the various crops. We may now proceed to explain the nature of the tables which the reader will find on pages 250 and 251.

It will be seen that there are three columns to each of the cereals. The first gives the Government return of the acreage under crop in the year 1866. This return was of course collected by individuals properly qualified, and may therefore be depended on for correctness. The second column contains the ten-years average of the yield per acre ending in 1861, and collected and published by us in 1862, being the substance of 500 letters from all parts of the country. The large scope of this return, which comprehends seasons of all kinds and consequently crops of all acreage yield, may be considered as correct as it is possible to make it. The third is derived from the multiplication of the two first into each other, which gives the gross yield of each county, supposing it to be an average crop.

There is reason, however, to think that while the acreage yield of wheat of the kingdom has increased, the breadth of land under wheat has decreased, although the consumption has certainly increased year by year. We ground our opinion on this subject upon the fact that the importations of wheat suddenly increased (on an average of seven years) from under five to seven million quarters. The turning-point was the year 1856, the average for the seven previous years being, as we state, five million quarters, whilst that for the next seven years was seven million quarters. There are several reasons for this assumed reduction of the breadth of land under wheat culture. Amongst these are: the low prices of that grain for many years, and the comparatively high price of barley, which on many occasions approached near to that of wheat; the more expensive nature of wheat culture; the uncertainty attending its produce, and the fact that in a year of bad yield the price is kept down by importations below what a deficient crop would warrant to be profitable; the high price of animal food compared with that of bread-corn, which has led to the substitution of green and root crops for cereals—these and other causes, as we believe, have led to a gradual reduction of wheat culture, while the acreage produce has increased by the means of a higher system of cultivation. It will therefore be desirable for the Government to obtain an annual return of the same kind as that which was obtained last season. If the return of the number of acres under crops of cereals of all kinds be procured, it is then in our power to supply what is defective in the Government returns by the aid of the standard information in the second column of the present tables, and our annual reports of the crops, which contain the substance of six hundred reports from all parts of England. The value therefore of these tables will be well understood by all persons interested in the grain trade as well as grain culture. By them the extent of wheat culture, as well as that of other grain, is determined; as also the average yield both per acre and in the aggregate. A future Governmental return (*annually*) must solve the question of the fluctuation in the amount of the culture of any specific kind of cereal produce.

It would be impolitic to attempt to draw any deduction as to the yield of 'Sixty-six until the publication of our returns, which will be given in the course of a few weeks. We shall then be able to show the actual amount of produce in comparison with the average as taken from the yield of the ten years we have cited.

THE CARRIAGE OF LIVE STOCK.—Cattle and sheep are not good travellers, and, unless well cared for, have a very hard time of it, whether they go by ship or by railroad. The trade in animals with the Continent appears to be upon the whole well conducted; they are fed and watered at intervals on the journey to the coast, and also on board ship in the long voyages—as, for instance, from Oporto. Animals are worse off where the journey is shorter in distance, because it is not thought necessary to make any such provision for them, and then such cases of privation may occur as that stated in a letter which we published a few days since. The railways of the United Kingdom have abundance of refreshment-rooms for passengers on the road; but as for animals, sometimes kept standing for hours in trucks at a station, there is no refreshment from one end of their journey to the other. Cattle sent from Aberdeen to London are 36 hours on the road, and may be still longer when there are delays, and detentions for the passing of other trains; but when once placed in the trucks, they get no food or water until they reach their destination in the metropolis. Mr. Seymour Clarke, of the Great Northern Railway, stated to the Commons' Select Committee of last Session on the trade in animals that they cannot be fed and watered without being unloaded, and it is bad for them to be untrucked. It is represented that they cannot be got at safely by a man going into the truck, and that they must be allowed to come out and shake themselves and get a little accustomed to the place in which they are before they will feed. It would be necessary also to make provision for preventing the cattle of various owners getting mixed together without there being means for distinguishing and dividing them again. But the railway companies, it appears, will have no objection to such a proceeding if the cattle owners will bear the requisite delay and expense. It is stated that in ordinary weather a beast can be kept without water for 24 hours, and sustain no injury as an animal to be eaten; whether it is humane is another question. There is no doubt that the long journey from Scotland causes a state of excitement and a certain amount of fever; and the committee gave credit to the statement of one or two witnesses that the difficulty of watering cattle while in a truck will not be found insuperable, and that when an ox is thirsty he will drink. The journey of cattle is unlike the journey of a man: the animal has been driven into a truck, has to wait in it sometimes for hours before the journey begins, is terrified by the frequent screech of the whistle, and knocked about in the shuntings; and then at the journey's end comes the driving out of the trucks and through the streets. A beast that is timid is very much shaken by such a journey; it has a tendency to develop disease; and the animals are in a fevered state. The committee had evidence in relation to the transit of cattle from Ireland. A cattle salesman stated that they are so illtreated in loading on the railway trucks, and kept standing so long in them, that he prefers walking his cattle 70 or 80 miles. Stopping the trains and shunting them, he says, affects their feet; they slip, and the feet are very liable to get loose between hair and hoof. Arrived at Dublin, it is said, they generally get rest, food, and water. Then comes the voyage. A director of a steam-packet company observes that "of course there is a degree of roughness to make them go down into the ship;" and when there is a great pressure of cattle for transport a vessel gets overcrowded. From Cork the passage is 24 or 28 hours, but no food is given in the course of it. The cattle "are very much abused" again at the end of the voyage in driving them up from the hold. A wholesale butcher says they sometimes get dreadfully bruised; a beast badly bruised may lose £3 or £4 in value. The drivers will at times fill the railway trucks too full. It is stated by a wholesale butcher of Liverpool that cattle arriving from Ireland are a great deal more bruised and in worse condition than those that come all the way from Oporto. The Irish cattle, he says, are very wild, and the men who drive them are very wild, and do not use ordinary care. Irish grass cattle had a very bad character given to them in this respect before the House of Commons' Committee. "They are more restive than other cattle, more untractable and difficult of management." They "are very spiteful; you are obliged to be very cautious with them; they take more driving than any class of beasts we have." Foreign cattle are much quieter and more placid, they ar handled so much. The Dutch animals are shut up for six months of the year, and they are in the habit of being handled by the women and children. The attention of the committee was very much directed to the means of preventing the spread of infectious disease, and the feasibility of sending dead meat from the country into London instead of carrying the animal alive. Nearly a third of the meat now sent to London is brought in the form of dead meat, and the quantity is increasing very fast; but there are times in the year when it will not keep in a journey. We are now importing nearly 1,000,000 sheep and lambs from the continent in the year, and nearly 200,000 cattle, and these generally reach us in good condition; but the committee had grounds for recommending Government inspection of the state of ventilation of all vessels carrying cattle. It is clear also that they had grounds for their suggestion that the law relating to cruelty to animals needs enforcement in relation to the transit of cattle.

BEER, THE POOR MAN'S BEVERAGE.

Every master knows well the desire his men manifest for beer. They long for it continually; and upon every occasion of extra work they expect to have it, and in unusual quantity. In their every-day employment, it is considered a hardship to be deprived of it. In many districts in the West of England the labourers insist upon a daily allowance; and in harvest and hay-time they have it in almost unlimited quantity. Many, if not all, Shropshire farmers allow their men from three to five pints of beer daily throughout the year; and in busy times they have it without stint. This, too, prevails to a great extent in the neighbouring counties. Cider, in the cider counties, is preferred by the men to beer, and they have it instead. In both instances, the men hold out against infringements of such customs. Many masters, disapproving of such profuse consumption of these drinks, have offered to give their value, and more, in money, if the men would relinquish these pernicious customs, but hitherto with very little effect. Beer they will have: it is their own selfish privilege. The money in lieu would be spent by the wife in family matters. What do the majority of these selfish fellows care for that? They say they work for the family, and they ought to have *support*, *i.e.*, beer. To meet the wants and cravings for beer by his "day-labourers" is one of the most annoying and perplexing things, in a small way, that a master has to meet. There is no such thing as satisfying the great bulk of the labouring population in their allowance: "enough, with them, is certainly a little more than a man possesses." Beer they will have, and beer they ought to have in reason. It enters into all their calculations in value of work: to them it is one of the necessaries of life. It is the poor man's beverage." Why, then, should he not have it cheap? Well, how is the "poor man"—the labouring man—to obtain his beer cheap? We answer, first, by the abolition of the malt-tax; and second, by brewing it at his own home, or making it "home-brewed." How is this to be proved? First, we will take the malt-tax. This impost is 21s. 8d. per quarter nominal tax; but, as it is usually taken by the exciseman, it amounts to 22s. 6d. to 23s. 6d. per quarter. For instance, the gauger measures the malting barley when in the cistern, when in the couch (*i. e.*, as thrown out from cistern), then on the floor, and again on coming from the kiln. At each of the measurings there is a difference of some two or three per cent.; and it is almost the invariable custom to take the highest number of bushels on which to charge the "*duty*." If the barley is fine, and fresh thrashed, it will swell considerably, and, in this way, will yield from 1s. to 1s. 6d. extra duty. We take the extreme, then, to be 23s. 6d. per quarter. Now, abolish the malt-tax altogether, *i.e.*, 23s. 6d.—it comes so near 24s. per qr. (which would, at 3s. per bushel, cause a saving of 3s. per bushel) that we shall take it so, leaving out the fraction—this saving of 3s. per bushel would equal a saving of 3d. per gallon on beer to begin with. Then, as there will be no need for restrictions upon malting, all qualities of barley can and will be made into malt, and coarse qualities would, no doubt, become cheaper. These coarse qualities of heavy barley, when malted, would make excellent private beer, and, being mixed with the lighter qualities, would depreciate the price considerably, which, on this account, may be fairly estimated at twenty-five per cent. lower than the qualities now in general use, *i.e.*, from such barleys as the maltster conceives would be good enough to induce him to risk the duty upon being malted. No maltster will pay duty upon inferior barley. This twenty-five per cent. reduction in the price of useful malt for home-brewing would be equal to from 14s. to 18s. per quarter, *i.e.*, about 2s. per bushel. Malt is now worth 76s. per quarter; deduct, say, 23s. per quarter tax = 53s. per quarter; then deduct 14s. per quarter, the lowest difference in value between good qualities and inferior qualities = 39s. per qr., or, to take it at an average in round numbers, at 40s. per quarter, which is near enough for our purpose. It will stand thus: One bushel of malt is sufficient to brew 13 gallons of good beer; or one quarter of malt, at 40s. per quarter, will produce 104 gallons of beer—good beer. The "small beer" and the grains and yeast will generally suffice to pay for the requisite quantity of hops and the cost of brewing. Hence, then, we have 104 gallons of good beer brewed for 40s., or about 4½d. to 4¾d. per gallon; certainly not to exceed 5d. per gallon. By this it may be seen that the beer seller can obtain ample profit by selling his beer at one penny per pint. But *second*, we will take "brewing at his own home." Home-brewed beer is proverbially known as good, genuine, and wholesome—a great advantage to be secured. If the poor man possesses conveniences at home for such an extended operation as brewing, by all means brew it at home; but if not, such brewings might be accomplished under arrangements. Here would be a fine field for co-operative societies, *i. e.*, to provide small "brewing plants," and suitable buildings for general use in a district. The poor man could readily take all his requisites to the "brewing plant" or co-operative brewers, complete his brewing and the working of his beer, sell his yeast to pay for coals, and take home his grains for his pig in value for his hops. If he declines making his small-beer, but puts altogether in his working casks, his beer will not cost him above 4d. to 4½d. per gallon, and if properly brewed and well managed would yield him a good wholesome beverage. We will go a little further: suppose we make the poor man his own maltster too; he would find out methods to save the cost of malting. Like the Irish in the wilds of Connemara, he would steep his barley in the lake, *i. e.*, pond or ditch, or elsewhere, as his ingenuity can devise, lay it out to grow, and dry it in the sun. In this way he saves the cost of malting, which is about from 4s. to 5s. per qr., or to carry all out, a further saving in the price of beer of one-eighth, or a halfpenny per gallon. This, then, if all is carried out economically, and not allowing the poor man any cost for his labour, or rather that of his wife, who most likely would undertake it as part of her household duties, would bring down the price to fourpence per gallon; that is, one halfpenny per pint. Now, take the poor man's present weekly expenditure in substitution, *i. e.*, tea and sugar; tea is cheap, sugar is cheap; take half-a-pound of tea per week for no less than fourteen tea-drinkings for self and family—scarcely a nip in the pot—but it costs 1s. 8d.; his sugar at three pounds per week will cost 1s. = 2s. 8d. Now, for 2s. 8d. he can brew 8 gallons of good beer, according to estimates, &c., above. Which is of most value to a hard working man? Now to bring the matter home. What a family boon it would be if such an order of things could prevail as this; the poor man to have his pint of beer for breakfast and "supper" at 8d. per week—dinner [agricultural labourers can seldom get; the wife and family taking their tea, coffee, and sugar out of the remaining 2s. Suppose our estimates and values are somewhat overdone, enough is shown to prove that the poor man could, if the tax is taken off malt, obtain cheap beer. There is nutrition in beer. Is there any nutrition in his "whishey-washey" tea? Verily it is a crying shame to an enlightened country like Britain to persist in taxing the mainstay under hard labour, the natural and necessary drink of her toiling sons. It is an unpleasant and trying thing for the poor man to have to resort to so many vile drinks as substitutes for wholesome beer. His horehound beer, his agrimony tea, his mint infusions, balm infusions, rue infusions, camomile tea, chicory infusions, cold coffee, cold tea, are all made by him, and often prove highly acceptable upon a hot day and under heavy work. But why should such hardships be put upon the poor man? Let him have his drink as free as his daily bread, give him fair play without restriction, and he will soon better his condition. Look at the agricultural labourer, how he toils! He is up at four o'clock in the morning, to make his fire, to boil his water and prepare *his tea,* miserable stuff, *i. e.*, hot water, and a little coarse sugar; he takes his crust and nip of cheese; he must be at his work at six o'clock, perhaps after a three or four mile walk; he labours all day upon his crust and water, or some one of the intermixtures named above; he returns from his work and weary walk to his daily bread and the same innutritious tea or weak coffee, onion-porridge, and dish of potatoes, but no meat, or just enough to give flavour to the porridge. Is this the way an Englishman ought to live? Down with every tax that destroys or abridges a poor man's comforts or even his very living!

WATER—ITS GOOD AND BAD EFFECTS.

We have heard of the ignoramus, who remarked, with self-complacency at his own wisdom, that he had become satisfied that rain on the whole did about as much harm as good. Had he observed exclusively the bad effects of water soaking young and newly set trees, of winter killing on wet spots, and the general damage to cultivated crops by want of under-draining, there might perhaps be some excuse for his notion, although these cases would in reality be only additional proofs that the excess of a good thing is a positive damage. We call attention to this subject at the present moment more particularly for the purpose of guarding planters of fruit and ornamental trees against the loss which comes from autumn transplanting in wet grounds and watering trees in a dormant state, and we trust a part of our suggestions will be useful.

The amount of water required by plants and trees at different times in the year cannot be too well understood. After the leaves have fallen in autumn they remain in a dormant state for several months, and consume scarcely a hundredth part the amount required while growing rapidly in summer.

To apply water copiously to young trees after setting out, and before the buds open, is simply to over-soak the roots and cause decay. Or to allow them to become soaked after setting out in autumn, by not providing sufficient drainage to carry off the surplus of autumn rains, is still more hurtful; for the roots not only become water-soaked, but are liable to serious injury by freezing in too wet a state, and in a soil that will become frozen hard like stone through excessive moisture. No one precaution, therefore, is of more importance in setting out young orchards in autumn than to see that the ground is thoroughly underdrained. If the subsoil is gravelly or porous, and never retains water, no further care will be necessary; but in the more instances of heavy loams or retentive hard-pans, it should be promptly attended to.

Gardeners are well aware of the fact that to keep half-hardy or tender green-house plants in a healthy condition through the dormant stage of winter, they must receive as little water as possible, so that they do not actually wither. Half-hardy shrubs and trees which are killed when standing in moist or wet ground, have been wintered through, without injury, when planted in a soil kept unusually dry by an intermixture of small stone. We have never known an osage hedge seriously injured when standing on or near the line of a good tile drain, while without this precaution these hedges are not unfrequenly much disfigured at the North. The same care with young orchards would doubtless often prevent heavy losses.

So much for applying water to dormant trees. When they are in full leaf and active growth, the case is very different. The leaves pump up water through the stems, and throw it off into the air in the form of vapour, with almost incredible rapidity. It is often necessary to apply two or three gallons of water in each twenty-four hours to single vines growing in grape-houses dependent on an artificial supply. It is a curious and instructive experiment to cut off two branches of the grape, leaving one covered with its broad leaves, cutting them all off the other, and then placing both in the hot sun. The leafy one will throw off water so fast as to wilt the stem in a few minutes; the other will remain plump a long time. These facts show the importance of keeping trees, when in full growth, abundantly supplied with water at the roots. The question immediately comes up—How can this be best done? Not by pouring water from a pail or watering-pot on the surface of the ground, unless it be for quite small plants. Trees, the roots of which extend only a foot or two in each direction, and a foot below the surface, will occupy say ten cubic feet of earth, and require, for a moderate supply of water to soak it, at least three or full pails. It would be a formidable task to go over an orchard of 100 trees in this way, even if it were possible to diffuse the water through the soil. As commonly performed, a few pints only are given to each tree, and it is all dissipated before sinking an inch or two below the surface. A hard crust is formed, and the roots remain as dry as ever. It would be better if planters never resorted to artificial watering, but depended wholly on the incomparably better mode of supplying it by means of the broad, deep and capacious reservoir of a thoroughly cultivated and mellowed soil. Pulverize the earth well a foot deep, and it will hold like a sponge a surplus of two inches of water, whenever it rains sufficiently, ready for the use of the tree. This will be at the rate of more than four hogsheads for each square rod, or more than six hundred and fifty hogsheads per acre—an amount which artificial means could not very easily supply.

Before closing these remarks, it may be well to offer a few practical suggestions in relation to setting out small shrubs and plants in autumn. Everything of the kind is made tenderer by the necessary mutilation and removal. They should therefore have additional or special protection. Pressing the earth firmly with the foot and raising it slightly to throw off water, will sometimes be alone sufficient to prevent small plants heaving by frost; but an additional covering of fine manure, moss, evergreens, or leaves, is a great assistance. Stiff straws is often sufficient for late set strawberries; evergreen boughs are well adapted to the protection of rose bushes and other small shrubs. Nurseries and young orchards should be well provided with drains for surface water—we have known a loss of twelve hundred dollars at one time in a pear nursery, otherwise well drained, in consequence of the freezing of surface water which had accumulated in winter and could not escape.
—*American Country Gentleman.*

A HINT.—Colts thrive well on one quart of oats each daily with a good supply of bright straw and two pounds of hay The same quantity fed as cut feed, the oats being ground, will be much better for them.—*Irish Farmers' Gazette.*

THE CENTRAL CHAMBER OF AGRICULTURE.

THE TURNPIKE-TRUST QUESTION.

On Feb. 5th a council meeting of the Central Chamber of Agriculture was held at the Salisbury Hotel to consider the question of turnpike trusts and the abolition of tolls; Mr. A. Pell in the chair. There were also present Lord Lichfield, Mr. Maclagan, M.P., Sir M. E. Hicks Beach, Bart., M.P., Mr. C. S. Read, M.P., Sir G. Jenkinson, Bart., Captain de Winton, Mr. R. J. More, M.P., Mr. Richards (Shropshire), Lieutenant-Colonel Halford, Mr. T. Willson and Mr. T. Wright (Leicestershire), Sir Herbert Croft (Herefordshire), Rev. E. Symthies (Loughborough), Mr. Charlesworth and Mr. Clay (Wakefield and West Riding Club), Mr. Horley and Mr. Ford (Warwickshire), Mr. Burbery (Midland Club), Mr. G. Clive, M.P., Mr. G. H. Whalley, M.P., Mr. Holland, M.P., Mr. Duckham, Mr. Masfen, Mr. Hemsley, Mr. Smyth, Mr. Byron, and Mr. Gardner. After a very long discussion over a series of resolutions proposed by Sir George Jenkinson, the following were ultimately adopted: "1. That, as two committees of the House of Commons, one in 1836 and another in 1864, have, after full inquiry, reported that the turnpike system is vexatious and expensive, and that, under certain conditions, the abolition of turnpike-trusts as at present existing would be beneficial and expedient, and as some trusts are in course of abolition, thereby inflicting serious hardship and injustice on certain parishes, it is the opinion of this Chamber that turnpike-trusts should be abolished simultaneously, and that provision for the future maintenance of all public roads should be settled by legislation on a fair and equitable basis. 2. That as much of the expenditure in the formation of turnpike roads was incurred for Imperial purposes, it is the opinion of this Chamber that the Consolidated Fund should aid in the liquidation of the remaining debt, when that debt has been fairly appraised or valued by competent authority." A deputation was appointed to lay these resolutions before the Home Secretary.

THE TURNPIKE NUISANCE.

A conviction seems rapidly spreading that at last something is likely to be done to abate one of the most annoying of the pettier evils which kings and laws can cure—to get rid of an institution which once served a useful object, but whose day is now passed, and which has become simply vexatious. The matter is beginning to be discussed at quarter sessions and at highway boards, and from more than one of those assemblies very vigorous cries for deliverance have gone up. The first blow was struck in a quarter than which no part of the kingdom has a greater reason to complain. Let us ask any one who, living in London, never goes on turnpike-roads at all, or who, living in Norfolk, has the privilege of going on turnpike-roads without ever paying turnpikes—let us even ask one who, living in South Wales, is at least called on to pay turnpikes only at known and regular intervals—to accompany us into the picturesque district of southern Gloucestershire. There the evil is at its height, and thence the first cry came in the shape of a vigorous debate at the Michaelmas quarter sessions at Gloucester. The Gloucestershire magistrates emphatically did not cry before they were hurt. It is a distinct hardship, especially when you are going along through one of the loveliest regions in England, to be stopped to pay a turnpike five times in the course of twelve miles. This is no exaggeration: it is a plain statement of the case as regards the road between two Gloucestershire market-towns with a large population lying between them—the only road which, a few years back, was passable in winter. If we remember right, it was possible, by going to the top of the Cotswolds and down again, to avoid one gate out of the five. The region is one which supplied Sydney Smith with materials for an eloquent piece of description in his "Lectures on Moral Philosophy." He speaks of the rich vale, the broad stream of the Severn, the distant tower of Gloucester, the nearer hills of Dean Forest, the more remote glimpses of the Brecknock Beacons, the general beauties of a range of picturesque scenery stretching from Devonshire to Shropshire. Sydney Smith was doubtless only an occasional visitor, and his subject did not call on him to speak of more than those objects in the landscape which were most prominent to the eye. Now a turnpike-gate is happily not so prominent an object as the soaring crest of the Sugar-Loaf or the lordly tower of Gloucester Cathedral. But had it suited Sydney Smith's purpose to go down from the heights, and to take a nearer view of things in the Vale of Berkeley, we suspect that the arrangements of its turnpike-trusts might have become the subject of more than one witty saying. What he thus left undone has been undertaken by Sir George Jenkinson, a gentleman who, having failed in several attempts to win for himself a seat in Parliament, seems to be settling to work in a praiseworthy manner to make himself useful in a narrower field. If Sir George Jenkinson is really sent into the world to play the part of a more peaceful and legal Rebecca on this side of Offas Dyke, if he really has a heaven-sent mission to be the uprooter of turnpikes, we can certainly hail him as one of the benefactors of his species.—*The Saturday Review.*

THE "PLAN" OF A PLOUGHING MATCH

He had been endeavouring to gain distinction for goo ploughing ever since he had known anything about land, fo he believed it was one of the first things with which the farmer ought to be well acquainted. He was quite sure the man who could not plough well would never get a good crop, let the land be what it might. When he had come into this district he had met a thorough agriculturist, as well as a thorough 'man,' and they had had some little discussions together as to the best kind of ploughs. He had often been asked the question, 'Which is the best plough?' but he had always answered, 'I can't tell.' Being, however, born and bred up with the iron ploughs, whilst the gentleman he had mentioned had been brought up with the old Kent turnrise plough, they had, of course, had a good deal of talk over the relative merits of the two ploughs. He was anxious to find out which was the best plough, and, accordingly, he had joined the Hildenborough ploughing match on purpose to solve this question, as well as to find out whether they could not 'class the men,' instead of 'classing the ploughs,' and as to which plough was best for this district. He was happy to say the judges of ploughing at five matches he had attended had, for two years, given the prize to the 'Kent turnrise plough,' whilst last year it was divided between the 'iron plough' and the 'Kent turnrise.' This year he had no hesitation in saying which he thought deserved the praise. He had taken the judges back to see a certain young man's ploughing that day, against his own man, and had asked them, 'If we had that sovereign to-day for the best ploughing in the field, which would you give it to?' He was proud to say, the iron plough. At the Hildenborough ploughing match, he had seen the iron plough carry away the extra sovereign prize, and another time the same prize was taken by a foot-plough; and the conclusion he had come to, after attending various ploughing matches, was, that it signified not what kind of plough was used unless the ground was adapted for that plough. He thought, therefore, that, knowing the decision of the judges as to the merits of the ploughs, it was now time that they saw it would be better to aim at 'classing the men,' and not the ploughs. Having alluded to what he called the really excellent ploughing they had witnessed on this occasion, he said he might congratulate the society on having the master-plough in this district—the steam-plough belonging to the society. It was quite time farmers made use of this plough to their profit. He had begun life with a two-horse plough; and he was now proud and pleased to say that he thought he should end his life with one. But with such a master-plough as that which belonged to the society, he did think the exhibition of three and four horses drawing a plough was foolish, and that it was unprofitable to the farmer, when he could get his subsoil with a master-plough. He believed they would agree with him that from three to five inches were quite deep enough for any seed-furrow, and any sort of corn, where there was a subsoil well pulverised, and in such a condition as it ought to be for the crop to receive the full benefit of the subsoil as well as the soil. With regard to the classing of the men, the speaker advocated a class for young men about eighteen years of age, which class he proposed to call 'class

1,' and that these young men should go on progressing from class to class until they came to the 'class of merit.' He did not like the word 'champion,' as it savoured so much of what they were accustomed to associate with Sayers and Heenan; but he would recommend a class of merit, and that last meritorious prize he should like to be a silver cross, a medal, badge, or challenge-cup. He should also like this prize to be of such value that—as it was with the Volunteers—after it had been won three successive times, it might be kept and handed down in their families as an heirloom. It might even be of service to the winner whenever he got into unfortunate circumstances, as he might perhaps help himself out of his difficulties by disposing of it.—Mr. Kennimouth, at the Penshurst Ploughing Match.

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of this Society was held at Taunton on Tuesday, Feb. 5, under the presidency of John Tremayne, esq. There were also present—Messrs. R. S. Allen, H. G. Andrews, Richard Bremridge, C. Bush, R. H. Bush, J. H. Cotterell, R. R. M. Daw, J. T. Davy, F. H. Dickinson, Mark Farrant, John Fry, Jonathan Gray, Charles Gordon, J. D. Hancock, W. R. Hicks, Thomas Hussey, R. K. M. King, J. E. Knollys, H. A. F. Luttrell, H. G. Moysey, Rev. T. Phillpots, Messrs. S. Pitman, G. S. Poole, W. R. Scott, Ph. D., J. C. Moore Stevens, H. Spackman (Official Superintendent), and J. Goodwin (Secretary and Editor).

THE STOCK PRIZE SHEET was brought up for confirmation, and after an alteration in the time of shearing sheep, from May 1st to April 1st, so as to assimilate the practice of this society to that of the Royal Agricultural Society, it was ordered that it be forthwith printed and circulated.

THE ANNUAL FINANCIAL STATEMENT was brought up and considered, and ordered to be published in the forthcoming volume of the Society's Journal.

THE SALISBURY MEETING.—A long discussion, originated by Mr. Jonathan Gray, took place as to the best means of increasing the attractiveness of the opening day of the Salisbury meeting; and eventually a Committee, consisting of the Stewards of the several departments, was appointed to meet at the Secretary's office, in Bath, on the 8th of February, to take the whole matter into consideration.

DURDHAM DOWN.—Mr. Spackman, the official superintendent, having reported that Mr. Nelson had completed the restoration of the surface of Durdham Down to his entire satisfaction, the Secretary was directed at once to forward the amount due to Mr. Nelson, in accordance with the terms of his contract.

LIFE GOVERNOR.—Mr. John Tremayne, having paid an additional life composition to that entitling him to life-membership, was elected a life-governor.

NEW MEMBERS.—Mr. Henry Wood, Woolley House, Romsey; Mr. H. W. Godding, Brimslade, Marlboro'; Mr. W. H. Gale, Manor Farm, Burbage, Marlboro'; Mr. Richard Milward, Thurgarton Priory, Southwell, Notts; Mr. Henry Mayo, Coker's Farm, Dorchester.

THE SOUTHERN COUNTIES ASSOCIATION.

A meeting of this association was held on Tuesday, Feb. 12, at the Society of Arts. Present: Viscount Eversley in the chair; Col. Lennard; Mr. Benyon, M.P.; Hon. and Rev. S. Best; Mr. Lyall; Col. Deedes; Rev. J. C. Clutterbuck; Mr. Simonds, M.P.; Rev. John Goring; Mr. Clutton; Mr. Rigden; Mr. Punnett; Mr. Turner, and Mr. Wise; with the Rev. James Beck, and Mr. Shute, Secretaries.

A report having been read from the committee of general arrangements containing an approximate estimate of the expenses of the show-yard at Brighton, for fencing, shedding, and forage, it was resolved that the committee be empowered to enter into such contracts as may be necessary to carry out the recommendations contained in their report. The Hon. and Rev. S. Best, chairman of the Arts committee, having read a report calling attention, incidentally, to the wish expressed at Brighton that the Exhibition of Works of Art in the Pavilion might not be closed till the end of July, the Council, after acknowledging the handsome manner in which they had been met by the authorities at Brighton (though after considerable discussion as to the inconvenience of divided responsibility) came to the following resolution, proposed by Mr. Benyon, M.P., seconded by Col. Deedes: "That this association is prepared to undertake the responsibility of soliciting the loan of works of art and science for a period of five weeks, taking from the mayor and corporation a guarantee for the safe custody of the goods, after the first five days, for the remainder of the exhibition; that the total expenses of collecting and returning be borne in equal moieties by the association and the Brighton corporation, and the receipts of the first five days should accrue to the association."

The Sussex Horticultural Society having offered, on their own responsibility, to hold a show in the Pavilion for three days during the exhibition week, this offer was ordered to be acknowledged and thankfully accepted.

The secretary was directed to request the General Manager of the London and County Bank, as the bankers of the association, to allow the prize schedule to be exhibited at each of their branch banks in the six associated counties.

The Council then adjourned to Tuesday the 12th March.

New Members: Viscount Hardinge, South Park, Penshurst; Hon. Robert Curzon, Parham Park, Stonington; Mr. J. G. Dodson, M.P., Hurstpierpoint; Mr. J. Godfrey Faussette, The Precincts, Canterbury; Mr. Wm. Warner, Botley; Mr. H. J. Mulcock, Ropley Lodge, Alresford; Mr. George Shackel, Erleigh Court, Reading; Mr. Henry Wise, Feltons, Brockham, Reigate; Mr. George Jennear, Udimore, Rye; Mr. Robert Boys, Eastbourne; Mr. Thos. Saxby, Firle, Lewes; Mr. Frederick Gill, Beauham, Reading; Mr. Wm. Walker, Firle, Lewes.

POLICE GAME PRESERVATION.

There has not been of late years so flagrant an Act of class legislation as the Act passed in 1862, entitled "An Act for the Prevention of Poaching;" and certainly there has been no measure which has met with such general condemnation amongst all classes save the game-preserving landowners. Farmers are especially bitter on the subject; for not only has this Act, in many districts, diverted the police from their proper duty of protecting rural property, and for which they are paid out of the county rates, but the operation of game preservation has been rendered more than ever irritating and vexatious, both to the farmers themselves and their labourers. Perhaps the best practical comment on the opinion of the farmers as to this Act is, that its author and introducer, Sir Baldwin Leighton, then member for Shropshire, lost his seat at the late general election solely on account of his share in procuring the enactment of this obnoxious Act.

The existing code of game-law was, prior to the passing of the Police Game Preservation Act, an anomaly and a scandal. The additional turn of the screw effected by the late Act has rendered the game-law simply unendurable. In truth, the objects of the late Act to make the police the game-watchers of the squirearchy cannot be carried into execution, as appears from the following report of a game case at the Petty Sessions for the Kirby division of Warwickshire, held at Coventry: At the county hall, present Messrs. Morris, Pears, and Darlington, Mr. Dewes applied to the bench to take the information of police-constable Brown, in case of trespass for game on land belonging to Mr. Startin, of Exhall. It was intimated that Mr. Isaacs, the chief-constable, had given orders that no member of the force should give information in such a case, as it would be equivalent to making gamekeepers of the policemen. The bench refused to allow the officer to give the information. Mr. Dewes insisted that the magistrates were bound to receive the information, and stated that he should apply for a *mandamus* from the Court of Queen's Bench, to compel them to receive the information at the hands of the policeman Brown.

The judicious directions of the Warwickshire chief-constable in this instance have been supported by the discreet firmness of the Coventry bench. There are such frequent cases of the—to say the least—unhappy decisions by country justices in game cases that an instance to the contrary is worthy of note. Whether the fiery zeal of the game-preserver's attorney will lead him to carry out his threat of applying for a *mandamus*, because the justices have been rational, remains to be seen.—*The Economist.*

FOREIGN AGRICULTURAL GOSSIP.

Although frosts in May as well as the persistent rains of July and August injuriously affected the regular and normal development of all the crops in Prussia—particularly of rye and potatoes—the general result was upon the whole better than that of the preceding year, as well with regard to grain as with regard to straw and forage. Great difficulty was experienced in securing the hay, but the quality was generally good and even excellent. Taking the yield of an average year as a unit, we find that Prussian wheat figured in 1866 for 0.90, as compared with 0.77 in 1865, while hay figured for 0.93 in 1866, and 0.67 in 1865. Rye, however, which occupies a very important place in the agricultural production of Germany, and especially of Prussia, yielded in 1866 very unsatisfactory results, while in the Frankfort district the return amounted to little more than half a crop. Potatoes also resulted unsatisfactorily; not only did the tubercles acquire but little development, but they were also invaded by disease, and while the return of 1865 compared with that of an average crop was represented by 0.97, it was only valued in 1866 at 0.74. Taking an average of the ten years embraced between 1857 and 1866, we find that the average was attained as regards wheat, oats, and barley, but that it was 0.10 per cent. below the average as regards rye, and 0.08 per cent. below the average as regards potatoes. Prussia proper obtained in the period under notice the best crop of grain; and then comes Westphalia, Silesia, Pomerania, the Rhenish provinces, Saxony, the Grand Duchy of Posen, and finally Brandeburg. Prussian agriculture is not only occupying itself with the preparation of an inventory as to its last crop, but it thinks also of relieving itself of the impediments which oppose the free circulation of and the free trade in the principal agricultural products, such as flour and meat. The general meeting of the Agricultural Society of Rhenish-Prussia has given the signal of a crusade against the grinding and thrashing duties, against which it makes by the organ of Herr Weyhe the same complaints which are expressed among the French against the municipal *octroi* taxes levied. Herr Weyhe, who took in the capacity of a juror a very active part in the General Agricultural Exhibition of 1856, has attacked the question manfully, and affirms in the name of practice and science that commerce cannot acquire its full development in any state except on condition of meeting no obstacle to check its movements. The greater the amount of liberty which internal commerce enjoys, and the more numerous the means of communication, the more rapid also is the progress of civilization, and the more comfort and instruction penetrate among the masses. But in Prussia, as elsewhere, the existing state of things has its advocates and supporters, who defend the grinding and thrashing duties by the same arguments that are invoked among the French in favour of the *octroi* system. Thus it is urged that the taxes in question affect the tax-payer almost without his perceiving their existence; that they attain their object all the better, since they are imposed on matters of primary necessity; that they progress with the well-being of populations; and finally that they are more easy of collection than direct taxes. So much for the favourable side of the medal; now let us see the reverse, as it is presented by Herr Weyhe. In his eyes, the incessant control of the agents of the fiscal service paralyzes the activity of commerce, without taking account of the fact that the expenses of collection absorb 10 to 30 per cent. of the receipts, while a contraband trade, brought into existence by high duties, exerts round each town its demoralizing influence. Then Herr Weyhe contends that the taxes, being equally divided, weigh more heavily on the poor than on the rich; and while game and fowls are often relieved of any duty, bread and meat bear the integral weight of the tax. Hence it is that potatoes form the basis of the food of a large number of the labouring classes, who live on food which is not sufficiently restorative, and who are consequently predisposed to disease. After recalling the fact that the germs of a modification or a radical suppression of this state of affairs are contained in certain fiscal laws, Herr Weyhe supports his arguments by the example of Belgium, where the suppression of *octroi* duties since 1861 has yielded the best results; and he does not omit to mention, in passing, the complaints which French agriculture has often made heard on the subject of the heavy charges which the system of *octrois* imposes upon it, either directly or indirectly. Herr Weyhe sums up forcibly the unfortunate influence which the grinding and thrashing duties inflict on Prussian agriculture. First, the increased dearness of food products checks their consumption; then there is loss of time and money in the collection of the tax in large towns; then there are the vices of a system of taxation which favours the large animals of rich districts, to the detriment of the small cattle and agriculture of poor countries; and finally, there are the inconveniences of a system which, by checking the progress of grinding industry, closes an outlet to indigenous grain, and deprives Prussian agriculture of the refuse which it could utilize in feeding its cattle, and which profit foreign countries to which grain is exported in order to be converted into flour. It will be readily understood that the system has wearied the patience of Prussian cultivators, and that the representatives of the agricultural interest have carried the question in the first instance before the municipal administrations of the large towns of Prussia, and more particularly of Berlin; but the representations made have not obtained all the success which they appear to deserve. The deputations which have waited upon the municipal bodies have no doubt been very graciously received, and they have been accorded the honours of a discussion which has been summed up in a counter-project; but the majority has thought that nothing could be done unless the treasuries of towns could be filled by some other process, so as to provide for the expenses of a system of "edility" which those who contribute to it find very costly. The Agricultural Society of the North of Prussia has been discussing several matters of great interest. In the series of numerous questions which have occupied its laborious sittings, we remark a proposition of Dr. Helliegel with reference to the establishment of agricultural geological maps. Dr. Helliegel argues that a cultivator can proceed with certainty only on condition of being exactly informed as to the mineral composition of his soil, as, from a want of these indications, he risks the employment of calcareous amendments or phosphate manures, and attributes to such or such a substance the cause of a want of success, which he would have avoided if he had known that the matter of which he made use was already contained in sufficient proportion in the arable bed. Dr. Helliegel agrees implicitly with M. Chevreul, that manure is only a supplement, and that its *rôle* is all the more active as the elements which compose it are in a smaller proportion in the soil, and that they enter for a larger part in the constitution of the cultivated plant. The motion of Dr. Helliegel could scarcely fail to be adopted, as, independently of the good reasons alleged by its author on its behalf, it had the support of Major de Bennigsen, who has displayed much zeal and devotion in aiding in the preparation and dissemination of agricultural maps.

There has been a curious incident at Tulle, a French provincial town. The bakers, using their liberty, had carried the price of bread to 5d. per kilogramme, although it had been fixed previously at 4d. per kilogramme. The augmentation in price being not considered to be justified by the price of flour, the Baron Lafond de St. Mur, Mayor of Tulle, warned the bakers that it was his intention to re-establish the price at its former level in case they persisted in their exaggerated quotations. The warning rapidly bore fruit. Of fourteen bakers "in a state of exaggerations," eleven returned to the old price of 4d. per kilogramme (the fiftieth part of an English cwt.), one compromised matters with a charge of 4½d. per kilogramme, and only two held firmly by the 5d. rate. Municipalities in France have, it may be added, the right of "re-establishing" the price of bread, and here was an instance in which the re-establishment was carried out. The official *exposé* of the condition of the French empire just presented to the French Chamber estimates the deficit of the harvest of 1866 at 17 or 18 per cent., as compared with an average year. The production of wheat of an average year being superior in a certain measure to the want of consumption, the actual deficit of 1866 was probably reduced to 10 or 12 per cent. It must be borne in mind also that if the harvest of 1865 yielded only average results, it had been preceded by two exceptional years, the reliquats of which were certainly not absorbed either by exportation or by a more considerable consumption. However this may be, the result of the past harvest created a certain uneasiness, and in proportion as this uneasiness was confirmed, the ascensional movement in prices became more and more decided. Thus the price of wheat per hectolitre was maintained for the whole of France from January to April, 1866, at between 16f. and 17f. In May it stood at a little less than 17f. In June, on the markets which served formerly as regulators of the rates of the sliding-scale, the prices amounted to 18¾f., in July to 20¼f., in August to 21f., in September to 22f., and in October to 23¼f. The price remained stationary in November, but in December the upward movement returned, and the course of Wheat on the regulating markets rose to 24¼f. At the end of December prices were quoted, on the principal markets of the empire, between a minimum of 22f. to 23f., and a maximum of 28f. to 29f. per hectolitre, the average being about 25f, showing an advance of 8f. to 9f. per hectolitre on the rates current a year previously. "This fact," says the *exposé*, "sufficiently proves that it was not just to impute to the legislation established since 1861 the fall which took place in 1864 and 1865 in the price of grain. Those who pretended that prices could never again revive in presence of the competition which foreign cereals caused, or were likely to cause, to the products of our soil, must now admit that their fears were ill-founded. The suppression of the sliding-scale has been a benefit for agriculture as well as for commerce and for consumers. The Government well appreciated the situation when it replied to the complaints which arose that the fall which occurred in the price of cereals in 1865 and at the commencement of 1866 could only be attributed to a superabundance of resources proceeding from two very productive crops, that the injury resulting to agriculture was temporary, like the causes which had produced it, and that it would be sufficient for circumstances to change to enable prices to very promptly experience the favourable effects. What has occurred in the course of 1866 has rapidly justified these anticipations, and we have had evident proof that in a country like France, which in ordinary times is not a tributary of foreign nations for its supplies of cereals, the causes which act on the price of grain are more especially the abundance or insufficiency of the crops in the interior. It is these causes only which can produce a rise or fall in prices; and variations, far from being the consequence of the movements of our foreign grain trade, are, on the contrary, the regulator of them. This results also in the clearest manner from facts indicated in the course of 1866 as regards the importation and exportation of cereals. The exportation of grain and flour, which, under the influence of low prices, had acquired a great development in 1865, continued on a considerable scale during the first six months of 1866. Thus it averaged to June 30, 1866, 322,700 quintals of wheat and 280,211 quintals of flour per month. In July it also attained 221,558 quintals of wheat and 109,888 quintals of flour; but in the four following months it averaged only 49,784 quintals of wheat and 42,639 quintals of flour. As regards the imports an inverse state of things has been observed. Thus, the first six months of 1866 only furnished per month an average importation of 6,000 quintals of wheat and 700 to 800 quintals of flour. In August the importation of wheat amounted to 49,000 quintals, in September to 94,000 quintals, in October to 148,000 quintals, and in November to 149,000 quintals. The imports of flour were respectively 1,600 quintals, 6,200 quintals, 3,700 quintals, and 2,400 quintals. Upon the whole, if French agriculture reaped less last year, it saw the price of its products rise to a rather considerable extent, and it thus found a compensation for the losses which it had to experience in the course of preceding years, in which circumstances were more favourable to the consumer. "The progressive movement in the exports of agricultural products other than cereals, which had been observed in 1865, was continued in 1866, and French agriculture found in consequence new and more important outlets. Thus the exports of cattle from France amounted in the first eleven months of 1865 to 56,211 head, while in the corresponding period of 1866 they comprised 94,332 head. As regards sheep, the numbers exported from France rose from 130,062 head in the first eleven months of 1865 to 180,656 head in the first eleven months of 1866. The quantities of butter sent abroad from France in the first eleven months of 1866 attained a total of 22,687,318 kilogrammes, as compared with 17,850,238 kilogrammes in the corresponding period of 1865; of fowls and game the exports were 2,010,383 kilogrammes in the first eleven months of 1865, and 2,131,236 kilogrammes in the first eleven months of 1866; and of wine 2,585,810 hectolitres in the first eleven months of 1865, and 3,038,713 hectolitres in the first eleven months of 1866." Referring to the last outbreak of cattle-plague in the immediate vicinity of the frontiers of France—that is, in the cantons of the Grisons and St. Gall (Switzerland)—the *exposé* has the following valuable remarks: "We find here a fresh example of the effects so often demonstrated by experience of the existence of war in the North of Europe in connection with the propagation of typhus. It appears that the disease was introduced into the cantons of the Grisons and St. Gall by the Voralberg, and that it was brought there by animals purchased on the Vienna market in a large store lot which the Austrian Government sold after the termination of the hostilities of which Germany had just been the theatre. From thence the malady spread itself into several localities of the Grisons and St. Gall, making there a certain number of victims. But attacked and pursued with vigour at all points at which it showed itself, by the authorities of the districts invaded, and vigorously confined within the centres of infection by the surrounding cantons, the disease promptly ceased its ravages, and for some time past no new appearance of it has been reported. Nevertheless, the state of affairs with respect to the cattle-plague cannot be said to be everywhere so favourable. At present the disease exists in several of the German parts of Austria, and it also prevails in its possessions of Hungary, Gallicia, and Bohemia, as far as the extreme frontier of Saxony, where one case of it has been already indicated. In Holland the malady makes fresh progress; and limited hitherto to the provinces of Northern and Southern Holland and Utrecht, it has just penetrated into the Gueldre district. It has also appeared in the Dutch Limbourg, in the neighbourhood of the Belgian Limbourg. In Belgium it continues its intermittent manifestations, principally in the province of Antwerp. Finally, a recent communication has announced a case in a shed in the Prussian district of Clèves, in the neighbourhood of the Dutch frontier."

POTATOES.—The English county which produces the largest quantity of potatoes is Yorkshire, in which 47,735 acres were shown, by a recent return, to be devoted to the growth of that useful esculent. Next to Yorkshire came Lancashire, which had 38,090 acres under potatoes. Lincolnshire came next with 35,583 acres. The other English counties growing potatoes to some considerable extent are, Cheshire 21,854 acres, Cumberland 12,137 acres, Devonshire 14,994 acres, Essex 10,808 acres; and Kent 12,052 acres. All the other English counties had less than 10,000 acres under potatoes. No Welsh county came up to the standard of 10,000 acres, and only three Scotch counties, viz.; Fife 15,907 acres; Forfar 13,715 acres; and Perth 14,546 acres.

THE CULTIVATION OF GREEN CROPS.

Mr. J. K. Fowler, of Aylesbury, read a paper at the February meeting of the Midland Club. He commenced by referring to the importance of keeping up the supply of animal food; and to the remuneration attendant upon the breeding and rearing of live stock, which had caused agriculturists to devote much of their energies and skill to raising crops which might be either fed off or carted away for consumption in the fold-yard. There was but little difficulty on grass farms in procuring the necessary food, but his attention would then be chiefly directed to the consideration of the supply from arable or mixed farms. He believed that more stock and meat might be produced, acre for acre, on arable than on grass land. There were two distinct heads to which he proposed to direct his remarks—first, the production of green food for the summer and early autumn months; and secondly, that for winter and early spring. In the first list he classed winter and spring vetches, rye, winter oats, trifolium incarnatum, lucerne, rape, white mustard, and some few others; in the last the various sorts of turnips, swedes, kohl rabi, cabbage, and mangold wurzel. They would, therefore, see how great was the range, how difficult the task, of going through the culture of the whole of these plants, and in addition to that what time he should consume were he to go into detail of feeding them off and their chemical constituents. His plan, therefore, was to state the results of his own experience, and give a few gleanings from observations he had made in various parts of this country. As soon as harvest was completed he drew on to his land from fifteen to twenty loads of good yard-dung to the acre, and then with Smith's steam-tackle smashed the land up; this on an average of seasons killed what couch grass, thistles, docks, and other noxious weeds were found in the stubbles—and a certain portion intended for green crops, which in his neighbourhood for mixed farms of strong land, arable and grass, was about one-sixth — say sixteen acres out of 100. He sowed two acres broadcast with two bushels of rye to the acre, six acres of winter vetches, drilled with 2½ bushels to the acre, six acres being left for spring vetches, and about two for mangolds. With regard to the rye and vetches, about the middle of April, or even earlier—as soon as there is a bite—the sheep are folded, and have half-a-pint of oats and a little clover or hay-chaff daily. The rye grows rapidly, and by the time it is finished the vetches are ready. The sheep continue on these, and the first piece of rye is ploughed up, and sown with white turnips. The piece of winter vetches is also broken up, and the strings of couch grass which are found carefully picked out, and then sown broadcast with rape. Both are again fed off by sheep, and by that time the spring vetches are ready, and will carry the sheep on into August. That he found was the best plan for his strong clay lands. If there is not dung enough for the spring vetches in the autumn, a dressing is put on in the spring before it is prepared for seed. The advantage of this plan was that it involved no carting of roots off the land, except the mangolds, and little expense of hand culture. He was convinced that growing roots on strong tenacious clay, except a few acres of mangolds, which should be as near home as possible, was a mistake. He had seen extraordinary effects from rolling down vetches and ploughing them into the land green; one of the finest pieces of wheat he ever saw following such a proceeding. With regard to winter oats, he had sometimes grown them on land prepared as for vetches, and drilled about 2½ bushels to the acre, and had had a month's excellent feed for ewes and lambs in the early spring, and then had eight quarters of very heavy corn to the acre afterwards. They are also excellent as horse corn. The simplicity of the culture of trifolium incarnatum commended itself to their attention. He merely sowed broadcast on the wheat stubble 20lbs. of seed to the acre, and had never failed to have an excellent spring crop for early cutting for horses in the yard and for sheep, till June. The seed should only be slightly scratched in the ground with a light harrow or horse-rake. This is an excellent plant for filling-up deficiencies in clover-plant. Lucerne should be sown in May after a fine seed-bed has been prepared. It may be cut three times a-year and will last eight years. White mustard may follow vetches and be eaten off in autumn; or it may be sown when the first stubbles are broken up, after a fair dressing of stable-dung, and fed off by sheep. In treating the second part of his subject—the general root crops—he must go back to autumn cultivation, as he felt convinced that, with scarcely an exception, most of the land in England should be broken up in autumn. He was aware he should meet with much opposition on this point, on account of the work to be done at that season; but he recommended every occupier of 200 acres to sell a third of his horses and get a set of steam tackle, and in two years he would wonder how he ever got on without steam. In ordinary years he had broken up and cross-cultivated 300 acres of land, and packed up his steam apparatus by the middle or end of October, so as to have his horses in use for drawing out the dung, breaking up the clover, and sowing his wheat. As to root culture, his remarks would be addressed more particularly to those who hold light and less tenacious lands, than to strong clay farmers, and who for the purposes of the meat-market and for manure depend greatly on a winter supply of food. He commenced for swedes by first drawing on the land from fifteen to twenty cartloads (one-horse carts) of dung, which average about 15 cwt. each, and spread it at once on the stubble, the corn having been "fagged"—*i. e.*, cut close to the ground by hand-labour—and then with steam tackle smashed up the land at once, generally about nine to ten inches in depth. It breaks up in large pieces, the manure is partially drawn into the land, and it lies in a good rough state to receive the winter frosts. For all his root-crops, as well as vetches, that was his first preparation. Things remained thus until the end of February or beginning of March; and then he put a cultivator worked by horse-power over the soil, and he found it wanted but little doing to it. What weeds are found are picked out; and after that, two cwt. of best Peruvian guano to the acre, or four cwt. of Proctor and Ryland's or Griffin and Morriss's turnip manure, are added. Nothing suited his land so well as Peruvian guano. This is sown broadcast, and harrowed in; and in some instances, after a light ploughing, the roots are drilled in on the flat; but he oftener used a double mould-board plough, and threw the land up in ridges twenty-seven inches apart. If on the flat, he drilled swedes twenty-four inches apart, about the first week in May, using as much as 5lbs. or 6lbs. of seed to the acre. This was on account of the fly; for since he adopted the plan of thick sowing, he had never lost a crop. There were some disadvantages attending this, such as making the plants spindly, if you did not put the hoe in soon enough, and the great difficulty of singling them; but he had often adopted a plan first practised by Mr. Pusey many years ago, and which was so good that he must mention it. When the land was fine, and the rows straight and even, he sent the horse hoe across them, and cut the plants out about 15 or 16 inches apart, and left them in bunches, which were easily thinned by boys. They then grew rapidly, and after one or two more horse hoeings, and perhaps a turn twice with the hand, the crop was fairly on its way to maturity. He was as much in favour of the ridged system as the flat, and was guided by circumstances as to which he preferred. Should he be unable to manure the land in autumn he preferred the ridge, as he was enabled to put in the dung and cover it up better by that means, but he was convinced that it took at least six loads per acre more manure for the ridge than the flat. He had not time to go into the various diseases which affect the turnip, but he might state that once he was in danger of losing his crop—about ten acres, the best he ever grew—by the black caterpillar, when he turned in about 100 young ducks and about 150 chickens, with a boy to keep them moving, and in a few days they had destroyed every caterpillar in the field, the crop being thereby entirely saved. All the poultry wanted was a few pans of water. Mr. Fowler then proceeded to state his plan of pulling, carting, and storing the crop. He calculated his expense for a crop of swedes and mangolds at £13 7s. 6d. He considered twenty-five tons per acre a large crop. He had often heard of larger, but as a rule this was a great quantity to get off an acre of land. He was of opinion that it was not an advantage to grow immense roots. They were difficult to consume, *i. e.*, to cut up either in a cutter or pulpers, and were not generally so nutritious. On the other hand a small swede was the worst root almost they could give to cattle, as it was all outside and as hard as a stick, and no real value in it. A good swede of from 3lbs. to 4lbs., if they got an average, was the best of all, but how few crops ever attained that weight! He then gave a short statement of the best mode of feeding off a crop of swedes, which varied in different districts, and was much guided by the purposes for which the land was intended for the next crop, and also the sheep which were on it. He thought Skirving's King of the Swedes gave the heaviest root, Sutton's Champion the most even crop, and Dickson's (of Chester) Purple Top the handsomest. With regard to what he considered, for good deep land, the king of roots—the mangold wurzel—he need not go again over the ground about preparation, as it was essentially the same as for swedes, and the same observations might be made as to the advantages of the ridge or flat systems. He generally endeavoured to get his land ready by the end of March or early in April, drilling in about 6lbs. to the acre. This was again a large quantity, but of late years so many new insects had attacked the young plant that he had adopted this plan for safety: As soon as the rows appeared they were horse-hoed, and when fit were singled and set out about sixteen inches apart, the drills being twenty-seven inches. Besides the horse-hoeing nothing need be done to them till harvest, except perhaps once or twice being hoed over by hand. Should there be an occasional string of couch grass found, he sent a man over with a fork just before pulling them, when the leaves are withered, to pull it out. After the roots had been stored and the store ewes run over the land, when they ate a great portion of the leaves and small roots which are left in the ground, the land was immediately ploughed up and sown with white Chidham wheat. With regard to the kohl rabi, a most excellent root, which was rapidly making its way in this country, he liked it better every year he grew it. The same preparation as was described for swedes and mangolds must be followed. In conclusion, he asserted that the basis of all good farming was the successful cultivation of a first-rate root or green crop; and his general course of cropping, by which they would see he drove his land very hard, was first green or root crop, heavily manured; wheat; barley, dressed with 1½ cwt. of guano; beans, twelve loads of dung to the acre; wheat; clover, mown twice and carted home; and lastly wheat; and instead of his land going back each year, it was in better cultivation and the produce greater.

Mr. BALDWIN was in favour of growing swedes and turnips in ridges 3 ft. apart and 1 ft. between the roots, by which means he could grow thirty tons to the acre, the average of the roots 5lbs. each. For twenty-four years he had never grown less than twenty tons to the acre. He did not mean this was an average, but the lowest he had grown during that period. He contended that upon the ridge system the manure was concentrated under the roots, and that the larger the amount of soil and manure round the roots, the better they would grow. While the soil was sinking it was pressing the food to the plant, and the space they were set at allowed the sun to get to the bulb as well as the top. It also allowed space for the dropping of leaves to collect the dew, which, by the action of their rising in the morning, was run down to the root and fed it. By this plan he also avoided exposing the whole of the manure to the action of the sun. But early planting was essential, and you would not do any good unless the bulbs weighed 1lb. each on the 1st of August.

Mr. BRAWN moved a vote of thanks to Mr. Fowler for his able paper, which conveyed to them a great deal of information on a most important subject. He was glad to hear from him that he thought the growth of green crops the foundation of British farming, because many of their friends were disposed to place that foundation upon the plan of consuming a vast amount of corn by their cattle. This was like commencing to build a house with the chimney-pot. If by the purchase of 4s. worth of super-phosphate of lime, Peruvian guano, artificial, or any well-known special manure, they produced one ton of roots, which he held they could, and that ton was worth 9s. for consumption by their stock, then the raising of their green crops must ever be the foundation of agricultural progress and improvement. Mr. Fowler said that immediately after harvest he took an early opportunity of manuring and breaking up his land—a point upon which he seemed to anticipate some objection. He (Mr. B.) should be sorry to make the objection, but would explain his own plan. After harvest he attended to the cleaning of such stubbles as might need them, but afterwards he devoted his attention to the sowing of wheat. Then he spread the manure on the stubble land, which was thoroughly clean, and turned it in about four inches and a half with a pair of horses, which was very light work. He followed that up by a subsoil ploughing, which distributed the manure in equal quantities, giving a broken soil of nine inches. Mr. Fowler would tell them he would complete that operation at much less expense, but he held his system was in one way an advantages as his manure was placed midway in the soil. He was not one of those who yet thoroughly conformed to the opinion that it was safe to spread manure on the surface, leaving it uncovered by soil. The quantity he applied was about twelve tons per acre, but he did not restrict it to that quantity if more was to be had. As the time for sowing turnips arrived, he had them sown broadcast, with some 5 cwts. of specially prepared turnip manure, on the surface, and ridged up that with a double mouldboard plough. He had sown the seed in less quantity than recommended by Mr. Fowler, and he must say his experience as regarded broadcast sowing was not satisfactory. He did not agree with Mr. Baldwin as to wide ridging. He generally found that land which was ridged two inches under two feet brought a greater weight of swedes per acre than that which was two inches over the two feet.

Mr. MASFEN, in seconding the proposition, said the seed Mr. Fowler applied per acre was in excess of what he used. However, very much depended upon whether the seed was home grown or obtained from a seed merchant, for he could assert that 2lbs. of home-grown seed was equal to 5lbs. of purchased seed. With regard to the distance between the ridges, that depended on the cultivation of the land. If the land was in good condition it was not necessary to have the ridges too wide. On strong land the ridges should be wider than on light. He had the testimony of a friend that in nine cases out of ten ridges 22 in. apart and 12 in. between the bulbs was almost always successful. The paper was of a thoroughly practical character, and he thought the club were greatly indebted to Mr. Fowler for it.

Mr. LYTHALL would like to have heard from some gentleman present a few remarks on the growth of root crops under circumstances of rather more difficulty than those stated in Mr. Fowler's paper, which described the cases of farms close to towns, where an unlimited supply of manure was attainable. Perhaps a few words would not be out of place in regard to the method pursued in growing a crop of swedes successfully for many years some ten or twelve miles from any important town in the hilly district, about three miles from Northleach, where there was very little straw indeed, and on a large outlying farm where carting manure was expensive. The quantity of seed sown rarely exceeded 1lb. or 1¼lb. per acre, and he understood the crops had always been good. He believed if they could distribute the seed equally, and that of a proper description, two ounces per acre would be ample. Of course he was not calculating for the fly, to combat which, they used a water drill, which gave the plants such a start as soon placed them out of reach of the insect. With regard to the distance that the ridges should be apart, he thought the discussion tended to show it varied according to the tenacity and quality of the soil. About two feet and an inch or two appeared to be the average. Many people objected to sow any but transplanted seed, but in some parts of the Cotswolds they considered that transplanting every year had a tendency to make the roots less hardy. The resolution was passed with acclamation.

Mr. FOWLER, in responding, said as a general rule he preferred the ridge system: but, as he stated, he was not wedded to it. He was delighted to hear Mr. Baldwin's remarks with regard to wide drilling, as he was a strong advocate for it. He thought his opinion and Mr. Baldwin's were very much alike. With regard to Mr. Lythall's remarks he had forborne touching on the hill districts, as he hoped to have met some gentlemen from the Cotswolds, who would have given them some account of their experience.

Lord Sandon said they must all agree that Mr. Fowler's was quite a model paper—full of facts. His lordship, in resigning the chair, gave a resumé of the questions which had been raised by the papers, and discussions which had taken place during the past year.

WHAT IS SALEABLE UNDERWOOD?

In the Court of Queen's Bench, on the 18th ult., before the Lord Chief Justice, Mr. Justice Mellor, and Mr. Justice Lush, the following case came on:—

LORD FITZHARDINGE *v.* PIGOTT AND OTHERS.

This case raised a question as to what is to be considered "saleable underwood." It was an action to try the right of the defendants to distrain for poor-rates to which Lord Fitzhardinge had been assessed as occupier of "saleable underwood" in the parish of Wootton-under-Edge, in Gloucestershire, of which they were churchwardens. The plaintiff, Lord Fitzhardinge, disputed the validity of the rate, on the ground that the woods rated were not "saleable underwoods." The case came on to be tried in 1865, at the assizes before Mr. Justice Keating; when, however, for some reason or other, it was not tried, but turned into a special case for the opinion of this Court. The case stated that Lord Fitzhardinge is the owner and occupier of the woods in question, which cover some hundreds of acres, and in the parish of Wootton alone cover 170 acres. The woods are composed almost entirely of beech, having a little of ash and hazel intermixed, and consist chiefly of what are called "stools," but have a large number of "maiden" trees in them. A maiden tree is a tree springing from seed, and which has never been cut down to form a "stool." A stool is formed thus: in a maiden tree, near to the roots, a number of shoots spring out from the stump; these shoots, after a period, are cut off, and fresh shoots again spring out; and this process is continued as long as the vitality of the stool continues. By the continuation of this process, the stool gradually increases in size, presenting, when cut, the aspect of the head of a pollard tree standing above the ground; and in the case of the very ancient ones, the appearance of several such heads fixed to and forming part of a spreading mass of wood, partly above and partly below the ground, and supported from roots throughout. The treatment of the woods is as follows: They are cut in patches of several acres in extent, in such a manner that each patch is cut, on an average, once in thirty years. There is a cutting every year of some portion of these woods; but as the woods extend into the adjoining parish, the cuttings are not always at the same time. In cutting, some of the maiden trees are cut down near the ground, some left standing, some of the stools are cleared entirely of all stems or shoots, and some have stems or shoots left on them called "leaders," the object of the cutter being to have the uncut maiden trees and leaders scattered with tolerable regularity over the ground, and so as to favour their full growth. The maiden trees and leaders thus left are about ten years old, and vary from 7 feet to 20 feet or 25 feet high, the latter being in general the case. The number of leaders in a stool varies. Sometimes, as already stated, the stools are clear, and there are none left; but generally one, two, or three leaders are left—in some cases, even six or seven. During the period of thirty years, which elapse before the next cutting, the uncut maiden trees and leaders do not increase so much in height as in bulk; and inasmuch as the woods are on a hill, and the soil and situation at the bottom are more favourable to them than at the top, they increase more rapidly the lower they are on the slope. At the end of that period, they are generally from twenty-five to thirty feet high, even at the top of the woods. Some attain, and some nearly attain what is called timber-size in the timber trade, *i.e.*, 6 in. quarter girth half-way up, which roughly approximates to 32 in. round at the bottom, or not quite 4 in. quarter girth half-way up; and at the bottom of the woods the growth is finer. During the same period, the stools also produce a large number of other fresh shoots, which, when the time for cutting comes round, are of various sizes, but not fit for the purpose of what is called pit-wood, or coal-pit timber, which ought to be at least 2½ in. or 3 in. quarter girth. When the woods are cut, those stems which are large enough for pit-wood or coal-pit timber are trimmed of their branches, and their tops cut-off at the proper heights, so as to form stems or trunks to be sold for use in the coal-mines. As much of their branches and tops, and as much of the inferior stems as are large enough, are cut into cord-wood, and the remainder of the material is sold as brushwood or faggots. The object of this peculiar treatment in this kind of wood is to obtain pit-wood or coal-pit timber; and the obtaining of the cord-wood and faggots is subsidiary to, and only an inevitable and natural adjunct to, this treatment. The woods are bought standing from Lord Fitzhardinge, at from £8 to £10 per acre. The pit-wood or coal-pit timber is cut for the buyer by the woodcutters by the ton, and then sold by him by the ton or foot; and the brushwood and faggots are sold by him (the buyer) by the acre. It was admitted that, by the custom of the county of Gloucester, beech is timber, in the same sense as ash and oak are timber at common law; but it was contended on the part of the parish that shoots, sticks, stems, or germs growing from old stools, although of the growth described, and treated in the manner in which the produce of the stools in these woods has been treated, are not timber, and are liable to be rated to the poor as saleable underwood. In the county of Gloucester there are woods, consisting of large trees growing from their own roots, with underwood beneath them, in which the trees are cut down once for all, and are clearly "timber trees." Beechwoods of this kind exist in the district round the woods in question. Then there are beechwoods such as those now in question, and treated as above described. There are also woods consisting of oak and ash coppice, or underwood, growing partly from stools, partly as maiden trees, some of which woods are cut at intervals of thirteen or fourteen years, and some at intervals of twenty-one years, according to the nature of the soil; and proportions of oak, which is of slower growth than the ash. The ash is cut clean to the ground, but there is left a stock of oak stems, called "stores," growing partly as maiden trees, partly from stools, and of these "stores" at the next cutting about three-fourths are cut down and about one-fourth left, and called "double stores," which are cut down at the next cutting. Such of the wood as is large enough is used for fencing and similar purposes, but the main object is to obtain oak barks, which are most valuable when grown on young wood; where the coppice is purely oak, it is cut down clean, at about twenty-one years' growth. The third class of woods exist on the opposite or western side of the county. Then there are another class of woods consisting of hazel and ash underwood, on which the stems are completely cleared away every fourteen or fifteen years, and are greatly inferior in size to those in the wood in question, and are used for hoops and bundles, and are generally, though not universally, cut by the acre, but sometimes are cut by the ton. Woods of this class exist in the neighbourhood of the woods now in question. The woodcutters of the district call these beech woods now in question "timber," because they are not completely cleared, because they are not grown for coal-pit timber, because they are cut by the ton (timber being generally cut by the ton, foot, or pole); because there is so great an interval between the cuttings, and because of the size which the stems attain, as distinguished from woods of hazel and ash, in the district, which they call underwood, and which are treated as above described. With respect to timber merchants, surveyors, and land-agents, some call the woods "timber," because of their incomplete clearance, their fitness for coal pit timber, their being cut by the ton and not the acre, and because of the interval between the cuttings so far exceeding fourteen or fifteen years; while others call them underwood, because they are treated with the object of and so as to effect a long-continued series of reproductions from "stools," and because of the size of the stems being so generally under what is called timber size in the timber trade.

No succession duty has been paid on the woods in question, and they are subject to a tithe-rent charge; but no poor-rates were ever paid in respect thereof until 1864, when the 170 acres in the parish of Wootton were rated as "saleable underwood" at the sum of £1 14s. 10d. This was disputed by Lord Fitzhardinge as an invalid rate, and hence the present case, in which the question for the Court was, whether the woods in question are "saleable underwoods," and as such rateable.

When the case was opened, Mr. Justice Mellor observed that, if ever there was a question of fact fit for a jury, this appeared to be one.

Mr. J. J. Powell (with him Mr. H. James) argued for Lord Fitzhardinge, contending that the woods in question were not "saleable underwoods" in a legal sense. He insisted that it was a mere question of fact, depending on the custom of the country, and that it had been always decided that such woods were not "saleable underwoods." Oak and elm were "timber" at common law. Beech was timber by the custom of the country; and ever since the time of Lord Mansfield it had been held that trees which were timber could not be deemed underwood. Looking to the long period of time which intervened between the cuttings of these woods (no less than 30 years), it surely was not possible to call them underwood. Again, underwood was never thinned as these woods were, nor had beech trees ever been held underwood; so that, if now so held, it would be held for the first time in the history of our law.

Mr. Justice Mellor observed that in "Nolan's Poor Laws" (the best book upon the subject) it was laid down that, whether the wood came within the term "timber" either at common law or by custom, or whether, like hazel-wood, it was valuable only as underwood, was immaterial as to the question of rateability, which turned not upon the nature or quality of the wood, but whether in its cultivation or mode of management it was treated as underwood yielding annual profit.

Mr. Gray (with whom was Mr. Macnamara) argued for the parish officers in support of the rate, and said that this extract well embodied the view he submitted. The argument on the other side, he said, rested on a fallacy, which had misled Lord Mansfield, that wood which was timber could not be underwood. This was a complete mistake. Oak or elm might be underwood, and so managed as to produce an annual growth or fruit and profit. The old Act for the preservation of woods (35 Henry VIII.) recited that there were coppice-woods or underwoods, in which the wood was cut at periods of 25 or 30 years, showing that it was not because trees were cut at such distant periods that therefore they were not underwood. Lord Ellenborough had laid down the right test, Is it intended or destined for sale? So in a case in this court in Lord Denman's time it was said by Mr. Justice Littledale, "Small wood, never likely to be used for timber, may be called underwood," and so may plantations not intended for permanent growth, but to be cut at stated intervals for use, as hop-poles or other similar purposes.

The learned counsel was stopped in his argument, and the counsel for Lord Fitzhardinge called upon to reply, but he intended to cite the following literary authorities:—

"Underwood—the low trees that grow among the timber."—*Johnson.*

"Small trees that grow among large trees."—*Webster.*

"Wood growing under or below the higher loftier wood or trees."—*Richardson.*

"'Tis only for that thou dost naturally produce,
More underwood and brake than oak for greater use."
Drayton's "Polyolbion," sec. 28.

"As the multitude call timber trees promiscuously growing in a wood or forest, so am I bold to entitle these lesser palms of lesser growth by the name of underwood."—*Ben Jonson.*

Mr. J. J. Powell, being called upon to reply on the part of Lord Fitzhardinge, insisted that the test was, timber or not timber.

Mr. Justice Mellor then proceeded to pronounce judgment against Lord Fitzhardinge, and in favour of the validity of the rate. The test urged upon the Court by the learned counsel for Lord Fitzhardinge was, he considered, fallacious. The true test, as established by the later and better decisions, was the object with which the woods were treated. Here the woods were treated with a view to the raising of successive crops of shoots, which were sold for a profit. This was saleable underwood, and was not the less so because it was sold at long intervals, and if saleable underwood anywhere, it must be equally so in Gloucestershire. The principle was well expressed in the extract he read from *Nolan.* He came to the clear conclusion that these woods were to be deemed underwood, and rateable as such.

Mr. Justice Lush quite concurred, and said he entertained not the least doubt upon the question.

Judgment for the defendants.—*The Times.*

A STATE OF BEER.

TO THE EDITOR OF THE MARK LANE EXPRESS.

Sir,—I am not a member of any Temperance Society; I care not as to whether the malt-tax is, or is not repealed; I will leave the figures of "A Practical Farmer" undisputed, and make a remark or two upon what he says would be the benefits to the agricultural labourer by the repeal of the malt-tax. "A Practical Farmer" tells us: "Every master knows well the desire his men manifest for beer," that "they long for it continually," that "many, if not all Shropshire farmers allow their men from three to five pints of beer daily throughout the year, and in busy times they have it without stint;" and that "there is no such thing as satisfying the bulk of the labouring population in their allowance" of beer. Then "A Practical Farmer," having spoken of the abolition of the malt-tax, says: "What a family boon it would be, if such an order of things could prevail as this—the poor man to have his pint of beer for breakfast and supper, at 8d. per week." After being told that some men now get five pints of beer per day, all the year round, and very frequently get it without stint, and that there is no such thing as satisfying them, it is no exaggeration to consider that a man frequently drinks ten pints of beer daily at his master's. It would indeed be a family boon to allow a poor wretch, who never can be sober, to have a pint of beer morning by morning to enable him to arouse himself, and to drag his poor stupified body to his labour. But surely no practical farmer would encourage such a state of things. Is not every man taking beer to such an extent nearly dead until nearly drunk? Is he ever mentally fit to converse with his wife and children? Can he ever be in a frame suitable for thinking of another world? Is he half so good a labourer as the man who takes one fourth the quantity of beer? I have seen some of the strongest men, mowing corn, who could scarcely keep their equilibrium, from the effects of home-brewed—the strength named in figures, and who by no means had it without stint. I have seen men, by no means having beer without stint, completely bewildered in teaming a load of corn on to the stack. And even in harvest time, when the shades of evening come on, the man who has taken too much beer is not worth a farthing in the stackyard, for so soon as his eyes fail distinctly to see the sheaves, his brain cannot for a moment help him out.

If "A Practical Farmer" had shown that the labourers would take beer moderately, and only for their good, it would have been an excellent reason for the repeal of the malt-tax; but when he tells us that many masters have tried in vain to induce them to "relinquish these pernicious customs," and "there is no such thing as satisfying," to wish to repeal the malt-tax, that these unfortunate beings may wallow in dissipation, is of all bad arguments the worst. I will only add "A Practical Farmer" uses the following terms in reference to the labourers' longing for—craving for beer, "no such thing as satisfying with beer;" calls their drinking to excess "pernicious customs;" and then says: "Let him have his drink as free as his daily bread: give him fair play without restrictions, and he will soon better his condition.' I leave every reader to judge how he would better his condition!—I am, Sir, yours respectfully,

J. Watson.

Barlow Grange, Selby, Feb. 21.

THE NUTRITION IN BEER.

TO THE EDITOR OF THE MARK-LANE EXPRESS.

Sir,—A correspondent, in your last impression, entitling himself "A Practical Farmer," after a long essay upon the good the abolition of the malt tax would be to the working man, proceeds to say, "There is nutrition in beer." But your correspondent does not state how much nutrition it contains. I therefore beg to inform him that one gallon of the very best unadulterated beer contains only 8 oz. of nutritious substance. Your "Practical Farmer," although he enters at length into its manufacture, seems very ignorant of its properties. Beer is the fermented infusion of malt, flavoured with hops. In the first place, the barley is steeped in water to produce germination. Before germination the barley contains a large quantity of starch and gluten, which have very nutritious properties; but in germination the starch is converted into sugar, but still leaving the gluten. This sugar, in the fermentation, is converted into alcohol, and carbonic acid which escapes. The gluten which is still remaining in the beer rises to the surface in the form of yeast, so that only a very minute quantity of nutriment is remaining in the beer. The alcohol in the beer stimulates the labourer for a while, but it is a false stimulant, and reaction soon takes place in his system. Beer has the same effect on a man as the spur has to a jaded horse. Your correspondent then goes on to ask: "Is there any nutrition in tea?" No; but there is an active principle in tea called theine, which has in a degree the same effect on a man as alcohol, with this exception: That while alcohol is a false stimulant, tea is a real stimulant. He then goes on to say: "That it is a crying shame, in an enlightened country like Britain, to persist in taxing the mainstay under hard labour, the natural and necessary drink of her toiling sons." This sentence, sir, is so absurd as scarcely to deserve notice; but I deny that beer is a mainstay under hard labour: it may have the effect of stimulating. Hoping, sir, I have not trespassed too far on your valuable space, I remain, yours respectfully,

A Practical Chemist.

THE AGRICULTURAL DEPARTMENT OF THE PARIS EXHIBITION.

Daily trials of implements will be exhibited in the Isles of Billancourt and Seguin, and each class specially tested once every fortnight: live stock at Billancourt fortnightly throughout, according to the following programme, and fortnightly sales:

April: 1st fortnight—Sheep adapted for mutton; breeding stock. 2nd fortnight—Fattened stock.

May: 1st fortnight—Dairy stock. 2nd fortnight—Sheep for wool.

June: 1st fortnight—Draught horses. 2nd fortnight—Poultry.

July: 1st fortnight—Draught cattle; breeding stock. 2nd fortnight—Hunters, saddle and carriage horses, ponies.

August: 1st fortnight—Dogs. 2nd fortnight—Working oxen, in pairs harnessed, to be tested by work.

September: 1st fortnight—Pigs: breeding stock. 2nd fortnight—Asses, mules, and mule-breeding stock.

October: 1st fortnight—Fat animals. 2nd fortnight—Animals that have been or are susceptible of being acclimatised.

The animals exhibited during the first fortnight of each month must be sent so as to arrive on the 1st or 2nd, and removed on the 12th; those shown in the second fortnight should arrive on the 16th or 17th, and be taken away on the 27th. But exception to this rule will be made in favour of animals competing at Poissy and other local exhibitions.

The following premiums are announced:

A work of art of the value of 10,000f. to the exhibitor whose articles prove him to have rendered the greatest service to agriculture.

For methods and specimens of culture, and for agricultural instruments, seven Gold Medals of the value of 1,000f., 50 Silver and 50 Bronze medals.

For the animals exhibited, 20 Gold Medals (1,000f.), 150 Silver, and an equal number of Bronze Medals, in addition to honourable mentions and objects of art, which will be given as additions to 40 of the medals.

There is, however, considerable doubt as to the opening of the Exhibition taking place at the time appointed; for owing to the height of the Seine for so many weeks, a great deal of material is still afloat, and it is probable that at least an extra month for preparation will be required.

REVIEW.

THE LIFE OF A SALMON. Edited by A Fisherman. Day & Son, Gate Street, Lincoln's Inn Fields.

This is one of the most delightful shilling's-worths ever published, combining as it does the experience of the sportsman with the observation of the naturalist and the agreeable easy style of the educated gentleman. Salmo Salar, Esq., to use his own words, "struggled into existence in one of the tributary streams of the Upper Tweed," and we have thus many a graphic sketch of that glorious river in its various moods. It would be hardly fair, even if we could spare space for one of the exciting fights with a well-hooked fish, but the following taste will show how thoroughly qualified "A Fisherman" is to deal with his subject:—

"Of the various wiles practised by those fortunates who did escape, it may be interesting to make some passing mention. One, I remember, a grand fish of some eighteen pounds' weight, at the first touch of the hook dashed with lightning speed down stream, turning neither to the right nor to the left, running out a hundred yards of line. The fisherman having neglected to tie a knot at the end, there was nothing to stop it, and the great fish sailed away seawards, dragging in his wake two pounds' worth of excellent tackle. No doubt a few hours relieved him from the encumbrance, and his would-be captor paid not too dearly for a lesson he was unlikely to forget. One very extraordinary escape I witnessed was precisely analogous to my own when a smolt. The fish was hooked from the north or high shore; terrified apparently beyond the influence of instinct or reason, he dashed madly up the shelving bank on the opposite side, and lay gasping three feet beyond the shoal water. Taken aback by this utterly unexpected manœuvre, the fisherman slackened his hold, and the fish, with the same effort that restored him to his native waters, shook the hook from out of his mouth. I have seen fish escape by running rapidly round a rock, obtaining either for themselves a dead pull, and so wrenching the barb from their jaws, or, leaving a dead pull against the rock itself to the fisherman, afford him an excellent opportunity of breaking his tackle and releasing his prey. I have seen a fish spring three feet out of the water, when struck, and contrive in his descent to fall on the line, so as to break the hold of the hook. I have seen many, when but slightly hooked, by a violent and continuous effort *shake* the hook out of their mouths; and I have seen others, well hooked but too tightly held, break the strong line like packthread, or straighten the hook itself as though it were made of pin-wire. But perhaps the most efficacious, and to the fisherman annoying mode of escape, was one not uncommonly practised by a clean-run vigorous fish. Indeed, I must own that, though the kelts showed more craft and cunning, and brought to their aid great physical power, the fresh-run fish, for a clean rush and a stand-up fight, beat them hollow. The dodge they practised was as follows: swimming near the surface, and rushing down stream some thirty or forty yards, they suddenly sought the bottom, and returned upon their tracks with scarce diminished speed. The weighty water bagging out the line, gave the fisher, more especially if a tyro, the idea that his intended victim's course was still downwards, and, paying out line rapidly, he enabled the fish to bring such a weight of water upon it as eventually to necessitate its breakage. The first intimation Piscator had of the escape of his prey was the exulting bound of the salmon some fifty yards above the spot which in his imagination was occupied by that attached to his own line. This mode of effecting an escape I have heard designated as *drowning*, and certainly I have seen fishermen, after the manœuvre had been practised at their expense, look as though drowning were an enviable escape from their mortification. Another most successful manœuvre resorted to by a hooked fish, especially if a long line were thrown, was the running in of the salmon right to the feet of the fisherman. In vain the rod was held aloft, in vain the reel was wound with reckless haste, in vain its holder receded from the river bank, the line *would* become slack, and a shake and a scuffle at once got rid of the hook, unless it had penetrated more than ordinarily deep, or had struck upon some soft part of the fish's mouth. Happily, however, for us, there are few such parts in our mouths; if fresh-run the palate is soft, but the bone is hard beneath, and, if we have been long in the water, it is hard throughout; whether or no, a regular, firm, and equal strain must be kept on the hook, or the fish escapes; if the strain be too strong, the rod, or the line, or the gut, or the hook, or the hold in the mouth is broken; if it be slack, it is at once, and with ease, shaken out."

CALENDAR OF AGRICULTURE.

The sowing of grains must now go on rapidly, as spring wheat, oats, barley, peas, beans, and vetches, so fast as the means of execution and dry weather will allow. Flaxseed and lucerne on well-prepared grounds (allow 12 to 20lbs. to an acre); and sainfoin at 1½ cwt. to an acre, and dress with gypsum.

Sow parsnips and carrots on rich lands, without fresh dung. Drill at 18 inches wide on the flat ground, with seeds steeped in lees of urine or in a solution of nitrate of potass, six to one, and dried with hot lime.

Top-dress clovers and young wheats with salt, rape-dust, malt-coombs, gypsum, and nitrate of soda, the latter at one to two cwt. to an acre. Sow cabbage seed for summer plants.

Put light animals to graze water meadows. Set traps, and spread molehills. Bush-harrow, roll, and finish the dunging of grass lands.

The planting and cutting of timber trees must now be finished. Plant hops on dry lands, trenched and well prepared. Make the hills at six feet distance each way, which best admits the scarifier. Put four sets in each pit, one in each corner; and cover lightly with earth.

Begin to cross-plough the lands intended for green-crop fallows. Remove all turnips from the fields; and carry out dung in weather unfavourable for sowing.

Send the strong lambs to the natural and artificial grasses, or to the water meadows. The ewes will now drop lambs very fast, and require much attention. Feed amply with juicy food—swedes, beet-root, and cabbages, which must be preserved for this most necessary purpose.

The fattening of hogs for bacon will cease with this month; and the foremost fat bullocks will also be removed. Carry all dung to the manure-heaps, and keep all houses clean.

Set poultry on eggs, for hatching; and exchange eggs with any neighbour. Feed well, and attend to cleanliness; and provide good accommodation for the young broods. It is both pleasant and profitable to see a numerous and healthy flock of poultry on any farm.

CALENDAR OF GARDENING.

Kitchen Garden.

Begin early to dig, manure, and sow plots for the main crops of peas, beans, and all the summer vegetables, remembering that carrots require pure and very sandy loam, with any fresh dung, and that beet and parsnips do well in stronger land, with the dung placed low in the ground.

The soil should be rich for cabbages, Brussels sprouts, the broccolis, cauliflowers, and kales. Cauliflowers should be in rich grounds, much of the manure lying in the bottom of the trenches, under the roots. Guano water is an excellent liquid manure for them.

Transplant and sow for summer hearting cabbage. Sow a little Dutch red cabbage-seed and green curled savoy for Michaelmas.

Sow the best French lettuce-seeds and round spinach, and repeat every three weeks henceforth. The winter prickly spinach will continue to yield freely, if the weather be showery, to supply the demand.

Onions: The true Spanish for large bulbs, and the Strasburg for more common kitchen use, should go in early, in rich and deep grounds. Leeks are sown, to be transplanted.

For good radishes the land must be rich and light, moist and warm, to put the plants forward. A frame and lights are advantageous for early purposes. A sprinkling of Dutch turnips, a little celery for succession, small salading, nasturtiums for pickles, parsley, basil, and pot-herbs—namely, fennel, dill, borage, burnet, and sorrel—are to be sown during the month.

Plant mint, thyme, sage, marjoram, lavender, rosemary, and rue.

Plant early potatoes. Ash-leaved Kidneys, Second Early, the Champion, Prolific, and others that ripen in August, should be ready, and without manure, on loamy and sandy lands. Disease is more rare on dry lands than on the heavier sorts.

Fruit Garden.

Plant trees and shrubs, not beyond the middle of the month. Puddle in the roots, and cover with a thick mulch. Lightly fork the soil between the rows of currants, gooseberries, and raspberries; then cover the ground with leafy compost manure.

Flower Garden.

Sow hardy annuals about the middle of the month, as pinks, larkspur, and mignonette. The half-hardy are raised in frames. Herbaceous plants may now be set, and divided into new situations.

Cut box-plant edgings. Turn gravels, and put down fresh. Sweep lawns, and keep all places in neat order.

Carry all litters and vegetable substances to the manure-pit that is dug, and lined with bricks, together with all droppings of animals, and moisten occasionally with the washings and suds of the kitchen. Much good manure may be thus got, where animals are kept, from articles otherwise wasted.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

The weather having been fine for the time of year—only moderate quantities of rain having fallen in all parts of England—ploughing and sowing have become pretty general, with the land in fair condition for the reception of the seed. The planting of beans has progressed steadily. With very few exceptions, the accounts respecting the young wheats are very favourable. Even upon the lightest soils they have a regular growth, and very little damage has been sustained by the grub. The quantities of wheat, thrashed out having been limited, the whole of our leading markets have been scantily supplied with that description of produce. Nevertheless, the demand for all kinds has ruled heavy at a decline in the quotations of fully 2s. per qr. At that amount of depression millers have shown no disposition to add to their stocks. Owing to the arrival off coast of nearly 350,000 quarters, foreign wheat has been much neglected, though offered on lower terms. The quantity of wheat now afloat for England from all sources of supply is about 1,000,000 quarters. We shall, therefore, be well supplied with produce for some time; yet, as considerable inroads have been made upon the supply of wheat held in Essex and Kent, and as most of the corn in stack in the north is in poor condition, there appears to be very little room for any serious decline in the quotations.

The demand for barley, oats, beans, peas, and flour has continued heavy at drooping currencies.

The top price of town-made flour has fallen to 57s. per 280lbs.

The sale for wheat and most other articles in the continental markets has fallen off, yet very little disposition has been shown by holders to accept lower rates, either on the spot or for forward delivery. France and America are still supplying us with small quantities of wheat and flour, although, apparently, there is no profit on exports to Great Britain.

Owing to the want of foreign orders for cloth, the wool trade has been heavy, and prices have had a drooping tendency. About 90,000 bales of wool will be offered at public sale in London, and the arrival for the May sales is expected to be unusually heavy. It seems, therefore, that the high range of prices touched last year will not be exceeded this season, notwithstanding that scarcely any colonial wool is held in the manufacturing districts. Shearing has been commenced in several parts of England, and the new clip is expected to be very large and of fine quality.

Full average supplies of hay and straw have been brought forward, for which the inquiry has ruled inactive. Meadow hay has sold in the metropolis at from £2 15s. to £4 5s.; clover, £4 to £5 10s.; and straw, £1 18s. to £2 6s. per load. The quantities of hay on hand are moderately extensive. Some rather large parcels of meadow hay have been imported from the continent.

Fattening stock has fared well in the northern and other counties. The supply of winter food on hand is adequate to the consumption. Fortunately for the graziers, the losses from disease have been trifling. The pastures are mostly full of grass. There is, consequently, every prospect of a good hay crop.

The sale for wheat in the Scotch markets has been somewhat heavy, and prices have had a downward tendency. The transactions in all descriptions of spring corn, as well as in meal and flour, have been very moderate at barely late rates.

In Ireland very little has been passing in any kind of produce, either for home use or export. There has, however, been no disposition on the part of the growers to press sales.

The supplies of potatoes brought forward in the various markets have been rather extensive. Good and fine qualities have moved off steadily at from 100s. to 140s. per ton; but other kinds have sold slowly at from 70s. to 95s. per ton. About 500 tons of foreign potatoes have arrived in London.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although only moderate supplies of beasts have been on sale in the Metropolitan Market, the demand for most breeds has been far from active. In the early part of the month, the quotations ruled in favour of butchers; but since then, more firmness has been apparent in the trade at 5s. 2d. to 5s. 4d. per 8lbs. for the best Scots and crosses. With very few exceptions, the stock has come to hand in good condition, especially from Scotland.

The numbers of sheep, even including the foreign supplies, brought forward, have been limited, but of full average weight. The sale for even the best Downs and half-breds has not improved. In prices, however, very little change has taken place. The highest quotations has been 6s. 2d. for woolled, and 5s. for shorn sheep, being fully 4d. per 8lbs. lower than last yaer.

The few lambs on offer have moved off steadily, at from 7s. 4d. to 8s. 2d. per 8lbs.

Calves have realized high quotations, arising from the limited importations from the Continent.

Very few pigs have been brought forward, yet the sale for them has been heavy, and the top figure has declined to 4s. per 8lbs.

The imports of foreign stock into the Metropolis have been as follows:

	Head.
Beasts	7,333
Sheep	15,951
Lambs	1,208
Calves	1,098
Pigs	616
Total	26,206

Imports at corresponding periods:—

Total in	1866	29,241
,,	1865	22,904
,,	1864	12,228
,,	1863	10,500
,,	1862	3,600
,,	1861	8,485
,,	1860	7,018
,,	1859	7,809
,,	1858	2,320
,,	1857	4,720
,,	1856	3,087
,,	1855	2,839

The total supplies of stock exhibited in the Metropolitan Market have been:

Beasts	17,140
Cows	260
Sheep	79,710
Calves	1,081
Pigs	1,970

Comparison of Supplies.

Feb.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1866	21,240	340	85,070	1,125	1,215
1865	21,158	480	66,590	1,196	2,714
1864	20,422	469	82,540	1,254	2,962
1863	19,437	495	75,480	1,067	2,777
1862	19,970	510	74,192	766	2,750
1861	18,760	500	83,280	934	2,080
1860	19,750	322	87,536	974	2,094
1859	17,694	499	79,691	1,034	2,557
1858	18,276	466	69,070	1,091	1,559
1857	17,629	457	74,430	1,172	1,975
1856	19,642	495	99,950	673	2,614
1855	17,436	385	91,180	596	2,705

The arrivals of beasts from our own districts, as well as from Ireland and Scotland, thus compare with the two previous years:

From—	Feb., 1867.	Feb., 1866.	Feb., 1865.
Norfolk, Suffolk, &c. ...	5,800	7,100	9,200
Other parts of England	2,420	5,250	3,020
Scotland	1,235	2,720	1,220
Ireland.....................	380	700	500

The extreme range in prices has been: Beef from 3s. 4d. to 5s. 4d.; mutton, 3s. 6d. to 6s. 2d.; lamb, 7s. 4s. to 8s.; veal, 4s. 8d. to 6s. 4d.; pork, 3s. to 4s. 2d. per 8lbs. to sink the offal.

Comparison of Prices.

	Feb., 1863.				Feb., 1864.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef from............	3	4 to	4	10	3	8 to	5	2
Mutton	3	6 to	6	0	3	8 to	6	0
Veal	4	4 to	5	6	4	0 to	5	8
Pork	3	8 to	4	8	3	6 to	4	6

	Feb., 1865.				Feb., 1866.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef from............	3	4 to	5	4	3	6 to	5	6
Mutton	3	6 to	6	6	4	2 to	4	10
Veal	4	4 to	5	6	5	6 to	6	8
Pork	3	4 to	4	10	4	0 to	5	2

Newgate and Leadenhall have been well supplied with meat, for which there has been a fair inquiry, at the annexed rates; Beef from 3s. to 4s. 8d., mutton 3s. 2d. to 4s. 10d., veal 4s. 4d. to 5s. 4d., pork 2s. 10d. to 4s. per 8lbs. by the carcase. About 4,500 tons of foreign meat have been imported into London, and about 4,000 tons viâ Harwich. The decrease in the numbers of live-stock shown in London proves that slaughtering has become more general in various parts of England.

SOUTH LINCOLNSHIRE.

The weather is so favourable, and the land in such capital state, that every one is engaged in putting in the pea crop. It goes in admirably. We never recollect so much inquiry as to the best sorts for sowing, as in the present season—no doubt owing to the precarious character of last season for harvesting this crop. Some growers obtained satisfactory crops; others, owing to a later or earlier variety, suffered severe losses—hence inquiry. The Prussian blue and whites, fan-tail marrows, magnum bonum, and one or two exceedingly early varieties obtain most favour. Very little artificial aids are given, but it is good practice to use guano on poor soils. Preparations are also being made for the bean crop, seeding, and also for early potatoes. Nearly all the land is ploughed in readiness for beans, and a considerable quantity is laid up in ridges for potatoes. The latter is by this process put into a state as to require very little further preparation, than well breaking down before it is fit for the planting. No sooner is the pea and bean seeding over than our potato-planting begins. Our artificial manure-dealers are getting in their stocks, in order to prevent any disappointment for early planters; Peruvian guano, Lawe's superphosphate, Prentice's manures, Atkins's manure, and Odams's blood manure being the most popular aids. Growers also are getting in their stocks of seed, Dunbar regents direct from Scotland being in highest repute. There is some hesitation amongst growers as to the precise varieties best worth planting. Regents and Dalmahoys of superb quality have suffered more from disease than any other sorts. Flukes are first-rate in quality, but rarely yield an abundant crop. Rock and "red regents" nearly escape disease, and yield well. The question to decide is, which makes most money per acre? My recommendation is to set flukes on land in very high condition, regents on land in excellent order, and if the land is only just up to the mark, put in rocks. There is not much barley sown in this district, and that generally as a supernumerary crop. Oats are freely grown; Friesland, Canadian, Birley, and black Tartarians being the most approved sorts. We regret to report a serious reaction in the corn-trade. So far as this district is interested, it ought to be the other way, as most of the corn is thrashed out and gone; and moreover it has proved to be far less prolific than at first anticipated. In every respect the harvest was a more defective one than was at first supposed. The downward tendency must arise from foreign influences rather than our own markets. Wool, too, is considerably lower; our average piles would not just now realize more than 44s. to 48s. per tod. Beef and mutton partake of a like depression, the price being nearly 2s. per 14lbs. below Christmas prices. Both cattle and sheep are consequently much easier to buy. The greatest falling off, however, is in our pig markets. Pork is much cheaper, but that is as nothing compared with our store trade; fine large store pigs can now be bought for 30s. each, and sucklings (or rather weanlings) at from 2s. to 3s. each. All this marks the sensitive nature of the public mind. A little political strife upon the question of Reform, a little fear of Fenianism, a little fear of turmoil in some way or another destroys confidence; hence the demur. The losses of graziers during the past year have been enormous. It has been to the grazier simply, not being the breeder, one of the worst years known. Thousands of hoggetts, now shearlings, are not worth above two-thirds of their cost last spring. This is not owing to want of keep; turnips and mangels hold out well, and still retain their quality, or rather the turnips have recovered it since the frost; mangels are, of course, in the graves yet.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BANBURY FORTNIGHTLY FAIR.—Supplies short both in beasts and sheep: trade flat but dear. There were a few superior beasts on sale, which fetched from £25 to £30 a head. Several prices averaged beef from 4s. 6d. to 5s. 4d., and mutton 5s. 6d. per 8 lbs.

BARTON PIG MARKET.—The show of pigs was of a first-rate class, at prices similar to last week: for small 10s. to 14s., stores 18s. to 24s. each; small porkers 6s., large 5s. 3d. to 5s. 8d. per 14 lbs.

BEVERLEY HORSE FAIR.—This noted horse fair, which has been going on during the week, is as usual very brisk. Buyers from all parts of the kingdom have been present in great numbers. The show of horses has been larger than for some years, and valuable animals sold readily at high prices; but inferior ones met with purchasers according to their value.

BOSTON SHEEP MARKET.—A fair show of sheep. Mutton made from 7d. to 8d. per lb. Hogs were a dull trade at last week's rates.

BRIDGNORTH FAIR was very thinly attended throughout. The show of sheep was small, but good. Best fat wethers realised 8¾d. per lb., and ewes full 8d. Cattle there were none in the fair; but many good beasts were disposed of between farmers and dealers at the rate of 7d. to 7½d. per lb. Pigs plentiful at all prices. Bacon pigs fetched fully 6d. per lb., and sold fairly.

CUPAR-ANGUS MONTHLY MARKET.—There was a fair show of stock for the season. Prices ruled high, but sales were rather slow. The price for fat may be quoted at 10s. 6d. to 12s. per stone.

DUMFRIES PORK MARKET.—The supply of pork was larger than on last Wednesday—the number of carcases being 472. The weather was damp and mild, not such as curers like, and the carcases rather soft. There was a large attendance of buyers, and at the commencement the top price of last market was more generally given than last week. Towards the close of the market, prices rather dropped a little, but the whole were cleared off by eight o'clock. Prices: For prime carcases of average size 6s. 5d. to 6s. 7d. per imp. stone, heavier carcases 6s. 2d. to 6s. 4d., large carcases (under sizes) and Wigtownshire carcases 5s. 9d. to 6s.

ELGIN MONTHLY MARKET.—The stock was very large, and consisted chiefly of fat, and cows in calf. Business stiff, and prices down from 4 to 5 per cent. Capt. Culbard bought a lot rising two years at £14; Mr. Yool, Coulartbank, sold a lot of two-year-old stots at £30, and a lot of queys at £20; Mr. Rose, Sheriffston, sold a lot at £26 10s.; Mr. Robert Scott, Manbeen, sold a lot at £24; Mr. Dickson, Wester Alves, sold a lot of two-year-old crosses at £17; Mr. John Grant, Pitgaveney, sold a lot at £19 10s.; Col. Macdonnell, Calcots, sold a lot at £17 10s.; Mr. John Rhind, New Elgin, sold a cow at £12 10s.

GLOUCESTER MONTHLY MARKET.—A short supply. Mutton sold freely at from 9d. to 9½d. per lb. for best quality. Bacon pigs and pork sold at from 8s. 6d. to 9s.

GRANTHAM FAT STOCK MARKET.—A fair average show of sheep: trade dull. Mutton 7d. to 8½d. per lb.; pork 6s. per st.

INVERAVON MONTHLY MARKET.—Sales were rather stiff, best fat giving 65s. to 67s. Mr. Fleming, Marionburgh, sold 5 stots and queys for £105; Mr. Anderson, Shenval, 6 year-olds at £11 10s. each; Mr. Grant, Balnellan, a pair for £37; Mr. Smith, Nevie, a pair for £38 10s.; Mr. Smith, Mullochard, 2 stots at £22 10s. each, and 3 one-year-olds at £12 10s. each; Mr. Stables, Tombreckachie, 2 stots for £20 each, and 2 year-olds at £14 each; Mr. Collie, Bualdow, 4 for £18 each.

LINCOLN FAT STOCK MARKET.—A large supply, and trade somewhat slow. Ewes under 7d., and wethers 8d. per lb.

MORETONHAMPSTEAD GREAT MARKET.—The supply of bullocks was large for the season, while there was a decrease of sheep. The attendance of buyers was very large. Demand for cattle of all kinds exceeded the supply.

NORTHAMPTON FAIR.—Mutton in tolerable demand, and prices very little changed from last week. Pigs have become a heavy trade, and prices considerably reduced to what they fetched some time ago.

PENRITH FORTNIGHTLY MARKET was very meagrely supplied with sheep: there was a brisk demand in consequence, and the whole changed hands at an early hour, at prices much the same as those obtained at last market.

STEYNING MARKET was very moderately supplied with beasts, for the most part in good condition: the very primest Devons brought 5s. 4d., but the general top figure was 5s. 2d. per 8 lbs. Useful beasts made from 4s. 10d. to 5s., and cows and middling steers ranged from 4s. 4d. to 4s. 10d. per stone. The supply of sheep was small, and obtained a ready sale at full prices: prime Downs ruled from 6s. 8d. to 6s. 10d., whilst ewes ranged from 5s. 10d. to 6s. 4d. per 8 lbs. The supply of calves was very small, which sold readily at 6s. per stone. The pig trade was very quiet; scarcely anything doing—quarter-old store pigs realising from 12s. to 23s. per head.

THRAPSTON STOCK MARKET.—Fair supply of fat sheep, in and out of wool. Very large supply of fat hogs, at former prices.

WORCESTER FAIR.—The show of stock was not very large, although it was somewhat better than the last. The average price for mutton was from 8d. to 8½d. per lb., and pigs were about 10s. 6d. per score.

IRISH FAIRS.—Ballybay: About 1,500 pigs sold at good prices, say 50s. average. Considerable increase in number of cows, prices much the same as last month; young cattle few. A good fair for sellers of good horses; small demand for any other.—Oldcastle: Dealers from the English markets attended largely. Beef was quickly purchased at the following rates: Best quality from 68s. to 70s. for top lots; second class from 54s. to 56s.; inferior from 48s. to 54s. The springer fair was well supplied, the prices in all cases in favour of the seller. Best animals from £16 to £21; inferior from £9 10s. to £12 10s. There was a quicker demand for store cattle than at late fairs, and those in forward condition brought the highest rates of the season. Three-year-old heifers from £13 to £16 each; two-year-old from £8 10s. to £11 10s.; yearlings, £4 to £7; two-year-old-bullocks, £9 to £12; yearlings, £5 to £6 10s. There was rather a moderate show of sheep, but in brisk demand, and few left unsold; best wether mutton, 8¾d. per lb.; ewe, from 6½d. to 7d. A large pig fair, and quick business transacted; bacon averaged at 45s. per cwt.—Rathdrum: Milch cows were readily disposed of at from £11 to £15 each; springers were sold at prices ranging from £12 to to £16; three-year-olds from £12 to £14 10s.; and two-year-old heifers from £8 10s. to £11 each. In the sheep department a more than average amount of business was transacted; good mutton sold at from 6d. to 8d. per lb. There was a large supply of pigs, bacon selling at from 40s. to 48s. per cwt.—Taghmore: Beef from 55s. to 65s. per cwt., according to quality; milch cows from £11 to £12; springers may be correctly quoted at the same figures, a few of prime cattle bringing as high as £17; strippers sold from £8 to £13 (scarce); three-year-olds £11 to £16; two-year-olds, £6 10s. to £10; yearlings, £3 19s. to £6 each; mutton from 6¼d. to 8d. per lb.; two-year-old store sheep from 40s. to 53s. each; fat pigs from 43s. to 46s. per cwt.; stores from 30s. to 40s.; bonhams, 16s. to 20s. each.—Camlough: Fat cattle (half finished) were plentifully supplied, and sold at from £12 to £18; demand good. Springers were much sought after; the prices ranged high, and the number of sales effected were comparatively few. Prices for young cattle were £10 and £16; aged cattle in same condition averaged £9; back springers produced £12 and downwards. Milch cows averaged £8 to £13; strippers, about £9. Young stock was limited in supply, and the prices do not improve. Two and three-year-olds sold at from £8 to £15 10s., while yearlings averaged £5. In the horse department high prices were well maintained. Harness cattle sold at £20 and upwards; farming cattle, £18 down; hacks were sold at from £10 down.—Graigue: Three-year-old bullocks and heifers £12 to £14; two-year-olds, £8 to £10; and yearlings from £6 to £7 10s. Prime beef met a quick demand at 60s. to 65s. per cwt., and a few good bulls exchanged owners at prices varying from £25 to £30. Best mutton fetched 8½d. per lb., and inferior quality from 0½d. to 1d. less; hoggets 38s. to 44s., and a brisk demand; and milch cows much looked for at from £14 to £20. The pig fair was the best, perhaps, held in Graigue for many years, and pork showed an advance of from 3s. to 4s. per cwt., selling at fully 47s.; forward stores, 45s. to 50s. each, and smaller kinds in proportion.—Carlow: Best beef rated from 63s. to 67s. 6d. per cwt.; second quality from 56s. to 58s.; and inferior from 44s. to 48s.; springers sold at from £15 to £18 each; strippers and dry cows from £10 to £12 per head; three-year-old store heifers, £12 to £15; two-year-olds, £8 to £11; yearlings, £4 to £6; two-year-old store bullocks from £8 to £12; yearlings from £4 to £6 per head; best wether mutton from 8d. to 9d.; second quality from 6d. to 7d. per lb. The swine fair was very well attended, and all the bacon pigs and porkers were actively bought up. Bacon rated from 52s. to 54s. per cwt. Store pigs sold well; bonhams cheap.—Dundalk: Mutton was not plentiful, and quality only second-rate, yet 7d. per lb. was freely given. There was a fair supply of second-class beef, which brought from 55s. to 62s. per cwt. Milch cows in request at from £10 to £16, and strippers from £7 to £12; two-year-old heifers had a good sale, and were bought from £7 to £10. The swine department exhibited a large supply of fat pigs, stores, and bonnives; bacon pigs brought from 38s. to 44s. per cwt.. Porkers were from five to ten per cent. dearer.—Castlebridge: Beef brought from 60s. to 65s. per cwt. Milch cows brought from £11 to £18, springers, which were scarce, from £11 10s. to £15 10s., and strippers from £12 to £16 generally; some prime springers went up to £20; three-year-olds brought from £9 to £11, two-year-olds from £7 to £9, and yearlings from £3 15s. to £5 10s. Sheep commanded steady prices, fat sheep bringing from 42s. to 60s., stores from 35s. to 48s., sheep and lambs a fortnight or three weeks old from £2 18s. to three guineas for dam and lamb. Mutton may be quoted at from 7d. to 8d. per lb. Prices of pigs may be quoted as follows: Bacon pigs from 43s. 6d. to 45s., top 46s. 6d. per cwt.; stores from 30s. to 42s. each, some very advanced ones bringing

48s.; bonhams brought from 19s. to 30s. a couple. —SKIBBEREEN was one of the largest and best attended of any of the season, and for a long time there was not so smart and brisk a demand for stock of every description. The show of milch cattle was very good, and some really fine animals were on sale, and were picked up at rather smart prices, averaging from £9 to £12. Dry stock were also in good demand, and though the animals generally of this description were in rather poor condition after the unusual severity of the past few weeks, yet some of these fetched rather smart prices, and very few if any were unsold. The quantity of pigs on sale was very large, and by mid-day almost every one was sold, prices averaging from 31s. to 42s. per cwt., and in young bonhams a wonderful business was doing continually during the day, and an amazing number changed hands, at prices averaging from 10s. to 18s. a-piece. Of this description of property alone there could not be less than one hundred cart-loads at the fair, and few, if any, of this immense number remained unsold.

HOP MARKETS.

BOROUGH, MONDAY, Feb. 25.—The continued absence of business tends to make our market a shade easier: there is, however, very little disposition to give way in prices, the stock on hand being now but small, and the greater portion consisting of low grades. In the Bavarian market the supply is now extremely limited, and quotations are a little easier. The Belgian market shows a falling off in prices of from 4s. to 5s., with a very inactive trade. Advices from New York to the 12th inst. report the market as exceedingly firm, with a very diminished stock on hand of indifferent quality, and an upward tendency in prices.

Mid and East Kent	£8	10	£9	9	£11	11
Farnham and Country	8	10	9	9	11	5
Weald of Kent	8	8	8	15	9	5
Sussex	8	4	8	8	8	15
Yearlings	5	5	6	6	7	10
Olds	2	16	3	15	4	15

WORCESTER HOP MARKET, (Saturday last.)—Business on this market is quiet, but planters show no disposition to make concessions in price to force sales, feeling satisfied, from the general scarcity of stock, that present values will be realized when the demand becomes more active.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Feb. 25.—During the past week the arrivals, both coastwise and by rail, have been liberal, and more than equal to the demand, coupled with fine mild weather, the trade has been in a dull state at the following quotations:

Yorkshire Flukes ... ... per ton	120s. to 140s.
„ Regents	100s. to 120s.
Lincolnshire Regents	100s. to 120s.
Dunbar and East Lothian Regents	120s. to 140s.
Perth, Forfar, and Fife Regents ...	100s. to 120s.
„ „ „ Rocks.. ...	95s. to 100s.
French Whites	80s. to 90s.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Feb. 25.—The supplies are fairly extensive. Fine qualities are in request, at full prices; but other kinds are a slow sale. The import into London last week consisted of 1,784 bags Dunkirk, 40 tons Rouen, 68 sacks Trouville, 21 barrels Alexandra, and 45 boxes Cadiz.

Yorkshire Regents	100s. to 150s. per ton.
„ Flukes	120s. to 160s. „
„ Rocks	100s. to 115s. „
Scotch Regents	120s. to 150s. „

COUNTRY POTATO MARKETS.—BARNSLEY, (Saturday last): Potatoes were quite as dear. Rocks 12s., Prince Regents 14s., and flukes 15s. per load; retail, 1s. 2d., 1s. 4d., and 1s. 6d. per peck. DONCASTER, (Saturday last): A good supply, for which the demand ruled brisk, at about former prices. Wholesale, 12s. to 13s. 6d. per load of 18 stones; retail, 1s. 2d. to 1s. 4d. per peck. MANCHESTER, (Saturday last): Potatoes 8s. to 15s. per 252lbs. PONTEFRACT, (Saturday last): Potatoes 1s. 4d. per score.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Feb. 25.—Trade keeps very dull, with varying prices, even for the best.

Dorset, old	84s. to 96s. per cwt.
Devon	Nominal.
Fresh	12s. to 16s. per doz. lbs.

CORK BUTTER EXCHANGE, (Saturday last.)—The receipts this week were 1,574 firkins, of which 18 were mild. The market was extremely dull during the week, with declining price. Since Monday thirds fell from 91s. to 87s., and fourths from 70s. to 69s. Mild-cured thirds rose from 106s. to 107s.

GLASGOW, (Wednesday last.)—The market was well supplied with Cheese, and a fair business doing. About 35 tons passed the weigh-house. Dunlop, prime 65s. to 68s., secondary 58s. to 63s.; Cheddar, prime 68s. to 72s., secondary 64s. to 67s. per cwt.

GLOUCESTER CHEESE MARKET was moderately well supplied; the 20 tons pitched sold readily at from 68s. to 70s. for best quality, and from 60s. to 62s. for seconds.

THE RATING OF MINES AND WOODLANDS.

A Bill has been brought in, of which the preamble states that the courts of law have decided that only coal mines are liable to local rates, and that woods and plantations are not liable, while underwoods are rateable. It then provides that:

1. From and after the 1st of October next, mines and minerals of every description in England and Wales shall be liable to be rated to local rates, in the same manner and to the same extent, so far as circumstances will admit, in which and to which coal mines are liable to be rated to local rates; and all woods and plantations shall be liable to be rated to local rates upon the rateable value of the land on which they are grown.

2. Provided always, that where any mine shall at the passing of this Act be held upon a lease reserving rent in money, royalty, toll, or due, other than in kind, the occupier of the mine which by reason of this statute shall become rateable shall be entitled to deduct from the rent, royalty, toll, or due payable under such lease, one moiety of the sum charged upon him towards the said rate in respect of such mine before the day upon which such rents shall have accrued, and the lessor or person otherwise entitled to such rent, royalty, toll, or due shall allow such deduction in part payment thereof.

3. Provided also, that where at the passing of this Act any lord or owner of a mine is assessed to local rates in respect of such mine, nothing in this Act shall be held to disturb such assessment during the continuance of existing setts.

4. This Act may be cited as the "Rating of Mines, Woods, and Plantations Act, 1867."

TITHE COMMUTATION.—SEPTENNIAL AVERAGES.

SIR,—As many of your readers may feel anxious to know the result of the corn averages for the seven years to Christmas, 1866, published in the *London Gazette*, viz.—

Wheat	6s. 0¾d.	per imperial bushel,
Barley	4s. 3d.	ditto,
Oats	2s. 9¾d.	ditto,

I beg to state for their information that each £100 of tithe rent-charge will for the year 1867 amount to £98 13s. 3d., or about 1¼ per cent. more than last year.

The following statement from my *Annual Tithe Commutation Tables* will show the worth of £100 of tithe rent-charge for each of the following years:—

	£	s.	d.		£	s.	d.
1861	112	3	4¾	1865	98	15	10½
1862	109	13	6	1866	97	7	9¼
1863	107	5	2	1867	98	13	3
1864	103	3	10¾				

If we include the whole period of 31 years elapsed since the passing of the Tithe Commutation Act, it will be found that the general average value of £100 tithe rent-charge amounts to £100 16s. 2½d. I am, Sir, your most obedient servant,

CHARLES M. WILLICH,
Late Actuary, University Life Assurance Society.
No. 2, Montpelier-square, Rutland-gate, S.W.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

February on the whole has been a contrast to its immediate predecessor, mildness being its chief characteristic, with less of a downfall than usual, though there was plenty of rain at the commencement, and much heavy land remains overcharged with moisture; spring sowing has, therefore, but sparingly commenced. The young wheat, on the whole, looks well, though stunted and backward on the clays; a continuance however of this mild temperature may soon change its aspect. Frost would, however, have been much better for the newly thrashed samples, which ever since the thaw have been sadly wanting in condition, to the injury of the farmers; so we have to note a decline this month of 2s. to 3s. per qr. The dulness of English advices, coupled with a like depression in France, has very much changed the aspect of the trade, more especially as the Lower Baltic ports are no longer frost-bound, and it is expected the remainder will soon be open; all this being partially met by a Mediterranean fleet, supposed to comprise in all about one million quarters. Numerous arrivals are now reported; and as millers have kept low in stock, in apprehension of a decline, since this supply a better trade has been experienced. The tabular statement furnished by the *Mark-Lane Express* on the 4th and 18th February put us in a favourable position to estimate last year's produce in England, though it is still impossible to come to any exact computation of the injury done to the crop at harvest-time, which has differed very materially in the same county, either from the character of the wheat or the greater or less activity of individual farmers. By the table of the 4th instant we learn that the average growth of England for ten years has been 3 qrs. 5 bush. to the acre. By a very careful estimate formed upon the reports of the 18th instant, we arrive at the conclusion that last year's yield has only been 3 qrs. per acre on 3,761,431 acres; so by this estimate England alone is over two millions short of an average. When this consideration is coupled with the admitted deficiency of one-fourth in France, it becomes a serious question whether as the season advances we shall not be under a serious pressure for adequate supplies; as America, this year, is no longer a dependance, and it was known that our foreign stocks at the beginning of the cereal year were about three-fourths of a million less than usual. The present fleet will, therefore, all be wanted, though recently a source of great depression, and we believe as much more as foreign ports can spare to help us through the season, which yet has fully six months to run, and should any disasters befal the growing crops the late decline would soon be more than recovered. The following rates were recently quoted at the places named: White wheat at Paris, 69s., red 66s.; red at Brussels, 64s.; high mixed at Amsterdam, 73s.; white Zealand at Rotterdam, 55s.; the finest red at Hambro', 63s.; Holstein and Danish, 61s. 6d.; high mixed at Danzic, 61s.; red at Stettin, 55s.; at Manheim, 59s. 6d.; Polish at Berlin, 55s.; Banat at Vienna, 51s.; red at Genoa, 59s. 6d.; white at Valladolid, 55s.; Spring No. 2 at New York, 60s., white 77s.; spring wheat at Montreal, 51s. per 480lbs.

The first Monday in London commenced on a small English supply of wheat, but the foreign arrival was good. The show of samples during the morning from Kent and Essex was very limited, but after the mild damp weather the condition was very bad. A few picked samples were taken at 1s. to 2s. per qr. decline, but a reduction of 3s. would not have cleared the bulk, which remained unsold. The foreign trade was also heavy, and only retail, at a decline of 1s. per qr. The business on floating cargoes was quite suspended. Fair samples were not so depressed this week in the country. In many places there would have been a ready sale for fine samples, if holders had consented to a decline of 1s. In other places this concession was made, and a fair business was transacted; but mostly the want of condition kept millers from buying, except at a reduction of 2s. to 3s. The decline at Glasgow was only 1s. per qr., but no change was noted at Leith. Dublin did not give way beyond 1s. per qr.

The home supply on the second Monday was but moderate, and the foreign unusually small. But few fresh samples were exhibited during the morning on the Essex and Kentish stands, and, as the condition was somewhat improved, a reaction to the extent of 1s. ensued in seller's favour; but this advance was grudgingly paid, and inferior lots remained neglected. Foreign parcels were but in limited request, though holders were indisposed to take lower rates. The expected fleet off the coast only appearing sparingly, buyers deferred business till better supplies afforded more choice. As the country in the previous week had not been equally depressed with London, so many places now exceeded the London advance—Ipswich, Lynn, Salisbury, and Sleaford noting an improvement of 2s. per qr.; while a rise of 1s. was general, as noted at Hull, Boston, Spalding, Gainsborough, Leeds, Sheffield, Stockton, &c., though Bourn, Oakham, and a few other towns were dull. No advance was reported this week at Glasgow, but Edinburgh was 1s. per qr. higher. At Dublin prices were firm, but not decidedly dearer. Cork, Belfast, and the Irish markets generally were inanimate.

On the third Monday the English arrivals were moderate, and the foreign very scanty. The show of samples from the near counties was small; but the condition was mostly inferior, and produced a very dull market. Really fine and dry lots being scarce were not lower, though taken with great caution by millers at the previous currency. Inferior samples again went a-begging. The trade on foreign was also very restricted, but holders were firm in requiring the previous rates. Cargoes afloat found scarcely any buyers, who were waiting for further supplies. The country business this week, till Saturday, was generally without change of price; but business was greatly hindered for want of samples fit to grind. These mostly went off at previous rates, and in some places were called 1s. per qr. dearer. On Saturday, however, advices were 1s. per qr. lower in many markets. Glasgow and Edinburgh both noted a decline of 1s. per qr. on wheat; but at Dublin there was an improved demand for foreign, at fully the previous currency.

On the fourth Monday there was but a moderate arrival of English and foreign wheat. The morning's show from Kent and Essex was unusually small; nevertheless, with very fine spring weather and a large fleet off the coast, the market was excessively dull, and factors would have gladly cleared off at 1s. per qr. reduction, but found it impracticable. The retail business in foreign was at a similar decline; but a large trade passed in floating cargoes at 1s. to 2s. per qr. less money.

The arrivals in the port of London for four weeks were 19,224 qrs. English, 38,918 qrs. foreign, against 27,280 qrs. English, 56,579 qrs. foreign for the same period last year. The exports were 666 qrs. wheat. 70 cwt. flour. The imports into the kingdom for four weeks ending 16th February were 1,617,067 cwt. wheat, 242,795 cwt. flour. The London averages commenced at 66s. and closed at 63s. 8d. The general averages began at 62s. 2d. and closed at 59s. 10d. The amount of sales last year in four weeks was 255,639 qrs.: the last four weeks they were only 208,366 qrs.

The flour trade throughout the month has been heavy, with a downward tendency. On the first Monday country and foreign sorts declined 1s. per sack, and on the last Monday business could not be effected without a similar decline, and that only on a small scale. Town millers, who had been realizing high rates when wheat was dull, lowered their terms on the second Monday, from 60s. to 57s., as the top price at which the market closed. The Paris market has undergone great fluctuations, sinking from 80 francs to 71 francs per 157 kilos., and then partially reviving to 73 francs. There has been a difference of opinion as to whether the Government has influenced lower rates, or whether it has been the consequence of speculative movements. The imports into London for four weeks were 79,592 sacks country made, 3,676 sacks 9,366 brls. foreign, against 84,229 sacks English 8,078 sacks 5,441 brls. foreign for the same period in 1866.

Malting barley all through the month has been a dragging trade; but supplies have been too limited to occasion much decline, though to sell it has been fully 1s. to 2s. per qr. lower. The medium descriptions of foreign have also been dull; but grinding. being in short supply and constant demand, has not given way. Malting sorts have doubtless seen their highest, and secondary descriptions seem likely also to further decline. The arrivals for four weeks in the port of London have been 13,184 qrs. British, 30,380 qrs. foreign; against 21,097 qrs. British, 16,139 qrs. foreign, in 1866.

Malt has been dull all through the month, and the value has lessened 2s. per qr., with the prospect of a further reduction.

For a long time past the oat trade has not been so slenderly furnished; but the sudden breaking of the frost on present prices has made buyers so reserved, that they were resolved not to purchase to any disadvantage, and so have been waiting for the expected arrivals by steam from Sweden. No quantity has, however, yet appeared, but the first instalment was exhibited on the market on the last Monday; and though the entire arrival was scarcely an ordinary average, prices gave way 6d. per qr. With such favourable weather free shipments will soon be made; but as holders have very little on hand, the first arrivals may go off without any material reduction; but future rates will all depend on the imports, whether kept up on a large scale or not. The imports into London for four weeks were 8,254 qrs. English, 1,437 qrs. Scotch, 3,210 qrs. Irish, 39,213 qrs. foreign; against 10,799 qrs. English, 12,241 qrs. Scotch, 7,480 qrs. Irish, 108,103 qrs. foreign, in 1866.

Beans gave way on the first Monday 1s. to 2s. per qr., but the value has not gone down since. The arrivals of some Egyptian just at the time more English were on show seemed to have caused this reduction, but as foreign supplies hence are not expected to be large, there may not be much further change. The imports in four weeks were 5,531 qrs. English, 4,392 qrs. foreign; against 5,680 qrs. English, 3,041 qrs. foreign, in 1866.

Peas throughout the month have been dull, without material change. There was a decline of 1s. generally on the first Monday, but no alteration has been since reported. The sudden cessation of frost took away a good chance for boilers, but as the price is moderate we do not expect a further reduction. The imports into London for four weeks were 2,277 qrs. English, 1,677 qrs. foreign, against 1,917 English in 1866.

Maize has greatly fallen off in the supply, but its relatively high price has lessened the demand, and it has rather tended downward.

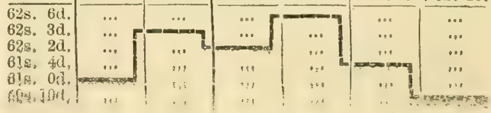
Linseed has been more plentiful, and yielded about 1s. per qr. in consequence, cakes giving way also about 5s. per ton; but we do not expect much further change, stocks being so small.

The cloverseed trade has been unusually backward and disappointing, there being no recent advance, in spite of the bad crop of English. It has been the same with trefoil; and tares, which were beginning to sell freely, have unaccountably stopped. Canary, mustard, and other seeds have been dull.

COMPARATIVE AVERAGES.

	WHEAT.			BARLEY.			OATS.		
Years.	Qrs.	s.	d.	Qrs.	s.	d.	Qrs.	s.	d.
1863...	55,576⅞ ...	47	2	52,991⅜ ...	36	3	13,492¾ ...	21	8
1864...	81,793½ ...	40	8	62,437⅛ ...	31	11	16,593¾ ...	19	1
1865...	67,929¼ ...	38	4	60,089½ ...	39	2	9,356¾ ...	19	1
1866...	61,055¾ ...	45	9	63,364 ...	33	9	9,844⅛ ...	23	0
1867...	42,427¼ ...	59	10	42,045⅛ ...	43	9	8,718¾ ...	23	6

FLUCTUATIONS in the AVERAGE PRICE of WHEAT.



IMPERIAL AVERAGES

For the week ended Feb. 16, 1867.

Wheat	42,427¼ qrs.	59s. 10d.
Barley	42,045⅛ ,,	43s. 9d.
Oats	8,718¾ ,,	23s. 6d.

AVERAGES

For the last Six Weeks:	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
Jan. 12, 1867	61	0	43	5	24	2
Jan. 19, 1867	62	3	44	5	23	4
Jan. 26, 1867	62	2	45	9	24	5
Feb. 2, 1867	62	6	45	2	24	6
Feb. 9, 1867	61	4	45	3	24	9
Feb. 16, 1867	59	10	43	9	23	6
Aggregate Average	61	6	44	7	24	1
Averages last year	45	9	33	9	23	0

LONDON AVERAGES.

Wheat	2872 qrs.	63s. 8d.
Barley	633 ,,	49s. 9d.
Oats	190 ,,	25s. 1d.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white... old 60 70...new	53 to	64
,, ,, ,, red ...... ,, 60 66... ,,	53	62
Norfolk, Lincoln, and Yorkshire, red	50	62
BARLEY ....33 to 36....Chevalier, new	40	52
Grinding....30 33....Distilling	39	43
MALT, Essex, Norfolk, and Suffolk ....new	70	75
Kingston, Ware, and town-made .... ,,	70	75
Brown .... ,,	56	64
RYE	32	38
OATS, English, feed 23 to 29....Potato	27	34
Scotch, feed ....23 30....Potato	28	34
Irish, feed, white 21 25....Fine	26	30
Ditto, black ....21 25....Potato	26	31
BEANS, Mazagan ...35 39....Ticks	35	39
Harrow ....38 43....Pigeon	42	46
PEAS, white, boilers..39 40 Maple 39 to 40 Grey, new	36	37
FLOUR, per sack of 280lbs., Town, Households	51	57
Country, on shore ....44 to 46 ,, ...	47	50
Norfolk and Suffolk, on shore	43	45

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Dantzic, mixed ....60 to 63....old, extra	64 to	71
Königsberg ....59 63....extra....	64	66
Rostock ....56 65....fine	64	66
Silesian, red....55 60....white	60	64
Pomera., Meckberg., and Uckermrk. ...red old...	58	63
Russian, hard, 52 to 58...St. Petersburg and Riga	55	60
Danish and Holstein, red	56	59
French, none....Rhine and Belgium	58	62
American, white 00, red winter 00 to 00, spring	00	00
BARLEY, grinding 29 to 31 ....distilling and malting	34	39
OATS, Dutch, brewing and Polands 22 to 30....feed	20	26
Danish and Swedish, feed 23 to 28.... Stralsund...	23	28
Canada 22 to 25, Riga 24 to 26, Arch. 23 to 26, P'sbg.	24	27
TARES, Spring, per qr. ...... small 42 ...... large ...	48	00
BEANS, Friesland and Holstein	38	42
Königsberg ....40 to 42...Egyptian	39	40
PEAS, feeding and maple...36 38...fine boilers	37	39
INDIAN CORN, white....35 38...yellow	34	37
FLOUR, per sack, French..44 52...Spanish, p. sack	46	52
American, per brl....26 30...extra and d'ble.	30	32

PRICES OF SEEDS.

BRITISH SEEDS.

Mustard, per bush., brown 15s. to 17s. white	10s. to	15s.
Canary, per qr	58s.	68s.
Cloverseed, red	54s.	74s.
Coriander, per cwt	18s.	20s.
Tares, winter, new, per bushel ....5s. 6d.		6s. 0d.
Trefoil	23s.	26s.
Ryegrass, per qr.	20s.	22s.
Linseed, per qr., sowing 68s. to 72s., crushing	65s.	68s.
Rapeseed, per qr	56s.	62s.
Linseed Cakes, per ton	£11 10s. to	£12 0s.
Rape Cake, per ton	£5 5s. to	£5 10s.

FOREIGN SEEDS.

Coriander, per cwt	18s. to	20s.
Cloverseed, red 54s. to 70s., white	86s.	104s.
Trefoil	19s.	22s.
Ryegrass, per qr.	18s.	20s.
Hempseed, small 38s. per qr., Dutch	40s.	42s.
Linseed, per qr., Baltic 63s. to 65s...Bombay	67s.	68s.
Linseed Cakes, per ton.	£11 0s. to	£12 5s.
Rape Cake, per ton	£5 0s. to	£5 10s.
Rapeseed, Dutch	58s.	60s.
Carraway ,,	42s.	44s.

ENGLISH WOOL MARKETS.

CITY, Monday, Feb. 25.—The supply of English Wool on offer is only moderate; nevertheless, the demand for all kinds is heavy, and prices are barely supported. The transactions for export to the Continent are limited in the extreme, as buyers generally are looking forward with much interest to the approaching sales of Colonial Wool, which will be commenced on Thursday next.

Current Prices of English Wool.		s. d.		s. d.
Fleeces—Southdown hoggets	per lb.	1 6½	to	1 7½
Half-bred ditto	,,	1 8½		1 9½
Kent fleeces	,,	1 7		1 8
Southdown ewes and wethers	,,	1 6		1 7
Leicester ditto	,,	1 6		1 8
Sorts—Clothing	,,	1 5		1 9½
Combing	,,	1 5½		1 11

BRADFORD WOOL MARKET, (Thursday last.)—The market wears a samewhat gloomy aspect to-day: there are indications of returning confidence, and staplers find more inquiry for favourite wools. Prime lustre sorts, both hogg and wether, are fully as dear as last week, or even a shade against the buyer, but this arises from the scarcity in this market; country dealers continue to hold out for full rates. Secondary wools are in no sense improved.—*Bradford Observer*.

LEEDS (English and Foreign) WOOL MARKETS, Friday.—The amount of business in English wool is wholly regulated by the absolute requirements of the manufacturers, and prices are well sustained by the holders. The offer of any considerable quantity for sale would probably produce a reduction. There are comparatively few sales of colonial and other foreign wool, and the approaching sales in London will probably prevent business till the range of prices next week is known.

GLASGOW WOOL MARKET, (Saturday last.)—A little better feeling has existed in this market during the week. There are some indications of returning confidence. A few lots have been disposed of, chiefly Highland wools. There is no appreciable change in price.—*F. H. M'Leod.*

OIL MARKET.

OILS.

Olive, Florence, ½ chests	£1 4 0 to	0 0 0
Lucca	1 0 0	0 0 0
Gallipoli, per 252 gallons	63 0 0	0 0 0
Spanish	59 0 0	60 0 0
Linseed, per cwt.	1 15 0	0 0 0
Rape, pale	2 1 6	2 2 0
Brown	1 17 0	0 0 0
Cod, per tun	46 0 0	0 0 0
Seal, pale	41 0 0	0 0 0
Brown, yel., &c.	0 0 0	0 0 0
Sperm	140 0 0	0 0 0
Head Matter	140 0 0	0 0 0
Southern	45 0 0	0 0 0
Cocoa Nut, per cwt	2 8 0	3 1 0
Palm	2 2 0	2 4 0

RESIN.

French	£0 8 0	0 15 0
American	0 7 0	0 21 0

PITCH.

British, per cwt.	£0 8 6 to	0 0 0
Archangel	0 10 0	0 0 0
Stockholm	0 12 0	0 0 0

TURPENTINE.

French	£1 16 0	0 0 0
American	1 18 0	0 0 0
Rough	0 13 0	0 0 0

TAR.

American	£0 0 0	0 0 0
Archangel	0 15 0	0 0 0
Stockholm	0 14 0	0 0 0

WHALEBONE.

Greenland, full size, ton	£525	£0
South Sea	410	0

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano direct from the importers' stores, £12 5s. to £12 10s. per ton.

Bones, £6 to £6 5s. Ditto Crushed, £6 10s. per ton.

Animal Charcoal (70 per cent. Phosphate) £5 per ton.

Coprolite, Cambridge, whole £2 10s., ground £3 to £3 2s. 6d. per ton. Suffolk, whole £2 to £2 10s., ground £2 10s.

Nitrate of Soda, £12 5s. to £12 10s. per ton.

Gypsum, £1 10s. Superphosphates of Lime, £5 5s. to £6 5s. per ton.

Sulphuric Acid, concentrated 1·845 1d. per lb., brown 1·712 0¾d.

Blood Manure, £6 5s. to £7 10s. Dissolved Bones, £6 15s. per ton.

Linseed Cakes, best American brl. £12 to £13, bag £11 to £12 10s.

Cotton Seed Cake, £6 15s. to £7 10s. per ton.

E. Purser, London Manure Company,
116, Fenchurch Street, E.C.

Guano, Peruvian	£12 7 6 to	£0 0 0
Do. Upper do.	6 10 0	6 15 0
Malden Island	0 0 0	0 0 0
Bone Ash	4 2 6	4 5 0
Brimstone, 2d&3rd	0 0 0	0 0 0
Saltpetre, Bengal, 2 per cent.	0 0 0	0 0 0
Nitr. of Soda, p. ct.	0 11 0	0 11 6
Cloverseed, N.Am. red, new per cwt.	2 18 0	2 13 0

Linseed Cake, per ton—		
Americ., thin, bgs.	£10 5 0 to	£10 10 0
Do. in brls.	0 0 0	0 0 0
English	11 0 0	11 15 0
Cotsd. Cake, decort.	0 0 0	0 0 0
Linsd. Bomby, p. qr.	3 9 0	3 10 0
Rapeseed, Guzerat	2 17 0	2 18 0
Niger	2 12 0	2 13 0
Tallow, 1st P.Y.C.	2 4 0	2 5 0
,, super. Norths	2 3 6	2 4 6

SAMUEL DOWNES and CO., General Brokers,
Exchange Court, Liverpool.

Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops	per ton	£8 0 0
Mangold Manure	,,	8 0 0
Prentice's Turnip Manure	,,	6 10 0
Prentice's Superphosphate of Lime	..	6 0 0

Printed by Rogerson and Tuxford, 246, Strand, London, W.C.

THE FARMER'S MAGAZINE.

MARCH, 1867.

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4 lb. for	20 sheep, price, jar included	£0	2	0
6 lb.	30 ,, ,, ,, ...	0	3	0
8 lb.	40 ,, ,, ,, ...	0	4	0
10 lb.	50 ,, ,, ,, ...	0	5	0
20 lb.	100 ,, ,, (cask and measure	0	10	0
30 lb.	150 ,, ,, included)	0	15	0
40 lb.	200 ,, ,, ,, ...	1	0	0
50 lb.	250 ,, ,, ,, ...	1	3	6
60 lb.	300 ,, ,, ,, ...	1	7	6
80 lb.	400 ,, ,, ,, ...	1	17	6
100 lb.	500 ,, ,, ,, ...	2	5	0

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

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From MR. HERAPATH, *the celebrated Analytical Chemist* :—

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Sir,—I have submitted your Sheep-Dipping Composition to analysis, and find that the ingredients are well blended, and the mixture neutral. If it is used according to the directions given, I feel satisfied, that while it effectually destroys vermin, it will not injure the hair roots (or "yolk") in the skin, the fleece, or the carcase. I think it deserves the numerous testimonials published. I am, Sir, yours respectfully,

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To Mr. Thomas Bigg,
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He would also especially call attention to his SPECIFIC, or LOTION, for the SCAB, or SHAB, which will be found a certain remedy for eradicating that loathsome and ruinous disorder in Sheep, and which may be safely used in all climates, and at all seasons of the year, and to all descriptions of sheep, even ewes in lamb. Price FIVE SHILLINGS per gallon—sufficient on an average for thirty Sheep (according to the virulence of the disease); also in wine quart bottles, 1s. 3d. each.

IMPORTANT TESTIMONIAL.

"Scoulton, near Hingham, Norfolk, April 16th, 1855.

"Dear Sir,—In answer to yours of the 4th inst, which would have been replied to before this had I been at home, I have much pleasure in bearing testimony to the efficacy of your invaluable 'Specific for the cure of Scab in Sheep.' The 600 sheep were all dressed in August last with 84 gallons of the '*Non-Poisonous* Specific,' that was so highly recommended at the Lincoln Show, and by their own dresser, the best attention being paid to the flock by my shepherd after dressing according to instructions left; but notwithstanding the Scab continued getting worse. Being determined to have the Scab cured if possible, I wrote to you for a supply of your Specific, which I received the following day; and although the weather was most severe in February during the dressing, your *Specific* proved itself an invaluable remedy, for in three weeks the Sheep were quite cured; and I am happy to say the young lambs are doing remarkably well at present. In conclusion, I believe it to be the safest and best remedy now in use. "I remain, dear Sir, your obedient servant,

"For JOHN TINGEY, Esq.,
"R. RENNEY.

"To Mr. Thomas Bigg."

☞ Flockmasters would do well to beware of such preparaions as "Non-poisonous Compositions :" it is only necessary to appeal to their good common sense and judgment to be thoroughly convinced, that no "Non-poisonous" article can poison or destroy insect vermin, particularly such as the Tick, Lice, and Scab Parasites—creatures so tenacious of life. Such advertised preparations must be wholly useless, or they are not what they are represented to be.

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CHIEF ACCOUNTANT.—James Gray, Esq.
SOLICITORS. — Messrs. Wilkinson and Co.
SECRETARY.—F. Clappison, Esq.
HEAD OFFICE, 21, Lombard-street.

At the Annual General Meeting of the Proprietors, held on Thursday, the 7th February, 1867, at the London Tavern, Bishopsgate-street, the following Report for the Year ending the 31st December, 1866, was read by the Secretary. Hugh C. E. Childers, Esq., M.P., in the Chair.

REPORT.

The directors, in submitting to the proprietors the balance sheet of the bank for the half-year ending the 31st December last, have the pleasure to report that, after paying all charges and interest to customers, and making ample provision for bad and doubtful debts, the net profits amount to £101,998 15s. This added to £17,468 16s. 6d., brought forward from the last account, produces a total of £119,467 11s. 6d.

They recommend the payment of the usual dividend of 6 per cent. together with a bonus of 8 per cent. for the half-year, both free of income tax, which will absorb £105,000, and leave £14,467 11s. 6d. to be carried forward to profit and loss new account. The dividend for the whole year 1866 will thus be 25 per cent.

At the meeting in February, 1866, it was intimated to the proprietors that the directors proposed to increase the capital of the bank, and at the meeting in August, 1866, the proprietors, by a resolution, adopted the recommendation of the directors. It will be proposed to act upon this resolution (which will require formal confirmation) by the issue of 12,500 new shares, to be offered *pro rata* amongst the proprietors as they appeared on the register on the 4th instant, the date when the transfer books of the company were closed, such shares to be issued at the price of £40 each, being a premium of £20 per share. The total number of shares will then be 50,000. Full particulars of the issue will be transmitted by circular to each proprietor.

The directors have to announce the retirement of Edward J. Hutchins, Esq., and William Lee, Esq., M.P., from the direction, and the election of Hugh C. E. Childers, Esq., M.P. and Edward W. T. Hamilton, Esq., M.P., in their stead.

The directors retiring by rotation are—Nathaniel Alexander, Esq., Thomas Tyringham Bernard, Esq., and William Nicol, Esq., who, being eligible, offer themselves for re-election.

There is a vacancy in the auditorship, through the disqualification of Mr. Robert Escombe, and it is in the power of the meeting to fill this up.

The dividend and bonus (together £2 16s. per share) free of income tax, will be payable at the Head Office, or at any of the branches, on and after Monday, the 18th instant.

BALANCE-SHEET OF THE LONDON AND COUNTY BANKING COMPANY, 31ST DECEMBER, 1866.

DR.

To capital paid up				£750,000	0	0
To reserve fund				250,000	0	0
To amount due by the Bank for customers' balances, &c.	£12,057,000	12	8			
To liabilities on acceptances	1,580,761	9	2	13,637,762	1	10
To profit and loss balance brought from last account	17,468	16	6			
To gross profit for the half-year, after making provision for bad and doubtful debts	319,957	14	9	337,426	11	3
				£14,975,188	13	1

CR.

By Cash on hand at Head Office and branches	£1,767,383	3	3			
By cash placed at call and at notice	734,056	3	7	£2,501,439	6	10
By investments, viz.:						
Government and guaranteed Stocks	£695,953	0	6			
Other stocks and securities	101,899	12	9	797,852	13	3
By discounted bills, and advances to customers in town and country				11,306,492	2	8
By freehold premises in Lombard-street and Nicholas-lane, freehold and leasehold property at the branches, with fixtures and fittings				176,313	12	8
By interest paid to customers				93,277	5	11
By salaries and all other expenses at Head Office and branches, including income tax on profits and salaries				99,813	11	9
				£14,975,188	13	1

DR. PROFIT AND LOSS ACCOUNT.

To interest paid to customers	£93,277	5	11
To expenses, as above	99,813	11	9
To rebate on bills not due, carried to new account	24,868	2	1
To dividend of 6 per cent. for the half-year	45,000	0	0
To bonus of 8 per cent.	60,000	0	0
To balance carried forward	14,467	11	6
	£337,426	11	3

CR.

By balance brought forward from last account	£17,468	16	6
By gross profit for the half year, after making provision for bad and doubtful debts	319,957	14	9
	£337,426	11	3

"We, the undersigned, have examined the foregoing balance-sheet, and have found the same to be correct.

(Signed) "WILLIAM NORMAN, } Auditors.
"R. H. SWAINE, }

"London and County Bank, 31st January, 1867."

The foregoing Report having been read by the Secretary, the following resolutions were proposed, and unanimously adopted:

1. That the report be received and adopted, and printed for the use of the shareholders.

2. That a dividend of 6 per cent., together with a bonus of 8 per cent., both free of income tax, be declared for the half-year ending 31st December, 1866, payable on and after Monday, the 18th instant, and that the balance of £14,467 11s. 6d. be carried forward to profit and loss new account.

3. That William Nicol, Esq., be re-elected a director of this company. That Thomas Tyringham Bernard, Esq., be re-elected a director of this company. That Nathaniel Alexander, Esq., be re-elected a director of this company.

4. That William Norman and Richard Hinds Swaine, Esquires, be elected auditors for the current year.

5. That Frederick Francis, Esq., be elected an auditor for the current year.

6. That the thanks of this meeting be given to the Board of Directors for the able manner in which they have conducted the affairs of the company.

7. That the thanks of this meeting be presented to William Norman and R. H. Swaine, Esquires, the auditors of the company, for their services during the past year.

8. That the thanks of the meeting be presented to William McKewan, Esq., and to the principal and other officers of the bank, for the zeal and ability with which they have discharged their respective duties.

(Signed) HUGH C. E. CHILDERS, Chairman.

The Chairman having quitted the chair, it was resolved, and carried unanimously:

9. That the cordial thanks of this meeting be presented to Hugh C. E. Childers, Esq., M.P., for his able and courteous conduct in the chair.

(Signed) W. CHAMPION JONES, Deputy-chairman.
Extracted from the Minutes,
(Signed) F. CLAPPISON, Secretary.

LONDON AND COUNTY BANKING COMPANY.

NOTICE IS HEREBY GIVEN that a Dividend, on the Capital of the Company, at the rate of Six per Cent., for the Half-year, ending 31st December, 1866, with a Bonus of Eight per Cent., will be paid to the Proprietors either at the Head Office, 21, Lombard Street, or at any of the Company's Branch Banks, on and after Monday, the 18th instant.

By order of the Board,
WM. M'KEWAN, General Manager.

21, Lombard-street, February 8, 1867.

ROGERSON & TUXFORD,] [PRINTERS, 246 STRAND.

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THE

FARMER'S MAGAZINE,

AND

MONTHLY JOURNAL

OF

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THE FARMER'S MAGAZINE.

APRIL, 1867.

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The Prime Minister

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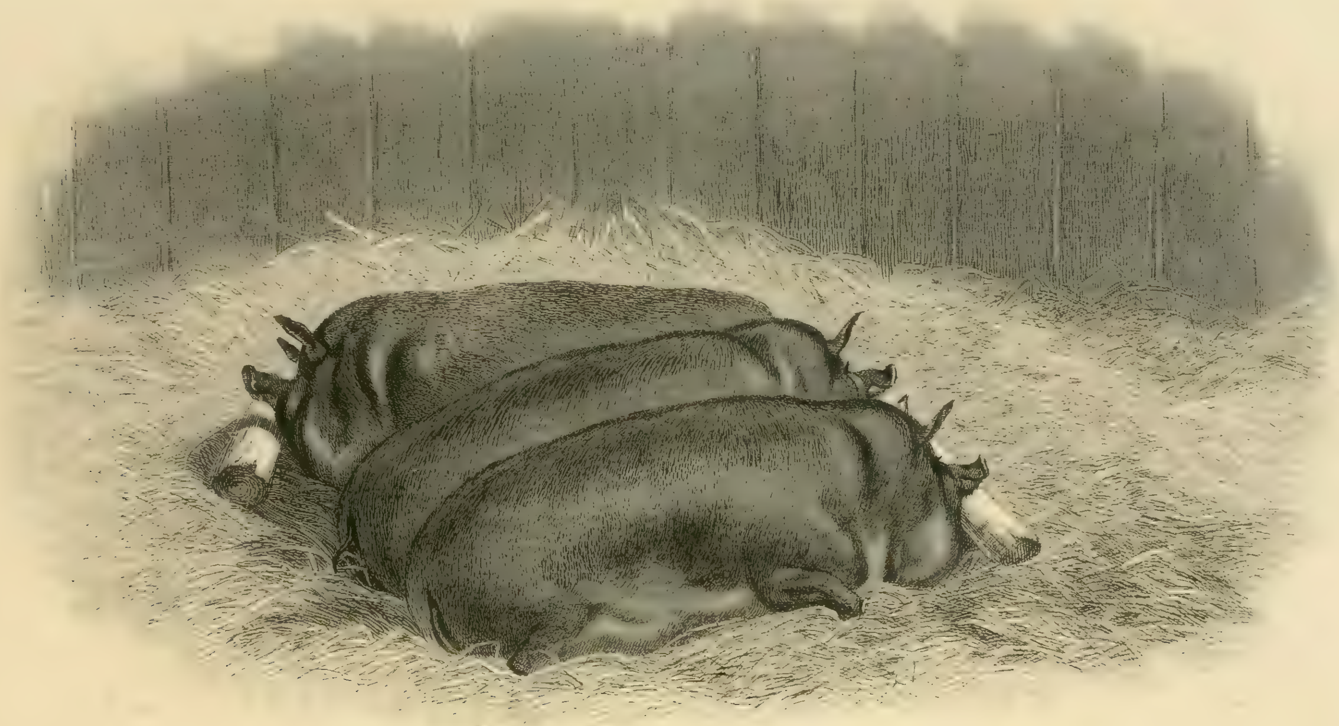

Improved Dorset Pigs

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THE FARMER'S MAGAZINE.

APRIL, 1867.

PLATE I.

IMPROVED DORSET PIGS.

THE PROPERTY OF MR. JOHN COATE, OF HAMMOON, BLANDFORD.

The Improved Dorset pigs trace their origin to a cross of the wild-hog with the Chinese, and the produce again crossed with a pure black Neapolitan boar. To Mr. Coate is due the credit of having established the breed; and he has since kept no other sort, beyond occasionally getting a cross from the best black sows to be procured, and then retaining the pick of the litter to breed on from. The Dorsets, as thus improved, are said to be hardy, docile, and good breeders. They have been exhibited at the Smithfield Club Shows for the last fifteen years, during which period they have won seven gold medals and the silver cup of 'Sixty-six, as well as about twenty silver medals and a number of money-prizes. They never escaped notice but once in London; while they are almost invariably winners at the country shows, either as breeding or fat pigs.

PLATE II.

THE PRIME MINISTER.

THE PROPERTY OF MR. GEORGE MATHER, OF HIGHFIELD, ST. ALBANS.

The Prime Minister, bred by Mr. Wadlow, in 1848, is by Melbourne, out of Pantalonade, by Pantaloon, her dam Festival, by Camel—Michaelmas, by Thunderbolt.

Melbourne, bred by Mr. H. Robinson in 1834, was by Humphrey Clinker out of a Cervantes mare. Although never half-trained, Melbourne was a really good race-horse, while he was by far the best sire of his day. His stock came out in 1846, and his death occurred in 1859, during which time somewhere about one hundred and twenty winners by him appeared. These included West Australian, winner of the 2,000 Guineas Stakes, the Derby, and St. Leger; Blink Bonny, winner of the Derby and Oaks; Sir Tatton Sykes, winner of the 2,000 Guineas Stakes and St. Leger; Cymba, winner of the Oaks; Marchioness, winner of the Oaks; Canezou, winner of the 1,000 Guineas Stakes, and of the Goodwood Cup, twice over; Mentmore Lass, winner of the 1,000 Guineas Stakes; Oulston, Prime Minister, and many other famous race-horses.

Pantalonade, bred by Lord Westminster in 1839, was also the dam of Harriott and Peppermint; throwing, in all, only four foals, three of which were really good runners. The mare died in 1850.

The Prime Minister is a rich dark-brown horse, standing fifteen hands three inches high. He has a neat but peculiar head, with the ears rather wide apart, and the Melbourne dash of white down the face; his neck is rather long, rising high and well from the withers; his shoulders well laid, middle deep, and back hollow (but then he is now in his twentieth year), with fine loins; he has grand quarters, great arms and thighs, and capital joints; he stands a little over, but is short and big below the knees and hocks, with well-inclined pasterns and good feet. The Prime Minister is very stylish out, and a good mover, showing lots of blood, with great substance, without a particle of coarseness, being all over what is known as "a little big 'un." He has altogether unmistakable characteristics of the Melbournes from the head to the curve in his dock, and from thence downwards, both fore and aft. He is a good-tempered horse, but resolute when roused; and when in work showed a deal of breeding and fashion.

Over his own distance—rather under than over a mile—The Prime Minister was a very dangerous horse; but the handicappers never forgot his two-year-old running, and, he always had the worst of the weights—that is, up to the last season or two of his running, when he had clearly lost his form. The Prime Minister covered some mares in 1855, and his stock first came out in 1858, with Lustre as a winner; as some forty others have since been credited to his account. Amongst these are Creeper, Zenobia, Athos, Maid of Honour, Pastime, Sporting Life, Charles Fox, Farfalla, Lord Burghley, Agnes Shirley, Duke of Cambridge, Lord Stanley, Statesman, Light, Lady Maud, Maria, Telscombe, Tesane, Zisca, Dot, Conservative, Katherine, Kintbury, Mr. Pitt, Pan, Sabrina, Spokesman, William Pitt, Aspirant, Dybbol, Homely, Knight of the Garter, Lady Pam, Miss Frances, Opposition, Premier, and Substance.

The Prime Minister, as our list of stallions will show, is still at Highfield, within two miles of St. Albans, where Mr. Mather has a very complete stud-farm, with a capital range of boxes, and Caractacus and Touchwood to keep his old horse company. The Prime Minister himself is under the charge of Fielding, who was for some seasons at Rawcliffe, and previously, if we remember aright, in the service of the Messrs. Tattersall.

NATURE'S FERTILIZERS OF GRASS-LAND.

BY CUTHBERT W. JOHNSON, F.R.S.

How many valuable hints are given to us by Dame Nature! and how slowly, in all ages, have men read her book, with the requisite care! And, if they have studied her laws, how tardily have they understood and acted upon them! We have a good instance of this in the fertilizers we now employ. These additions to our soils, were totally unemployed by the early cultivators of the earth. The first generations of men only cultivated the richest soils. They located themselves in sheltered diluvial districts: they dwelt near to rivers, whose flood-waters in winter enriched their meadow-land. And then, when men began to grow corn, they ploughed the best land in their vicinity, and took from it successive crops, until it ceased to yield a profitable return. It was then left to Nature's care, remained untilled for many years; and then, by what the farmers of the olden time were pleased to call "resting" the land, it was found capable of again yielding one or two fair crops of corn. The explanation of the good effects produced by "resting" the land seems never to have engaged the attention of the farmers of those days. They had not, indeed, the advantage of the science of our time. They possessed, in general, only one manure—that of the farmyard; and that, from the absence of artificial food, was poor in quality, and very limited in amount. The cultivators of that time wintered their stock with difficulty, roots being then unknown, killed their oxen at Martinmas, and lived on scurvy-producing salt beef and salt fish during the winter.

In those primitive days it was believed that our atmosphere was composed of only one gas, and that in this pure water was diffused. When, however, it was found that the air we breathe is composed of three gases, and that the water it contains has foreign substances diffused in it, other views with regard to the advantages derived from "resting" land began to be slowly entertained.

It was remarked as a very instructive fact that rain and snow-water both contain ammonia and nitric acid—not occasionally or by chance as it were, but wherever they have been analyzed. These substances exist, it is true, in the atmosphere in different amounts; but there, in some proportion or other, they have always been found. Then, again, in more minute proportions, phosphoric acid has been found in rain-water; and this also, there is little doubt, combined with lime, is often mechanically suspended in fine dust, and spread by storms over the land—is, in fact, frequently brought by strong currents of wind from very remarkable distances. Maury, in his valuable work on the "Physical Geography of the Sea," p. 266, gives a very curious instance of this transportation. "Seamen," he observes, "tell us of red fogs which they sometimes encounter, especially in the vicinity of the Cape de Verd Islands. In other parts of the sea they meet showers of dust. What these showers precipitate in the Mediterranean is called 'sirocco-dust,' and in other parts 'African dust,' from the continent whence it was supposed to originate. It is of a brick-red or cinnamon colour; and it sometimes comes down in such quantities as to cover the sails and rigging, though the vessel may be hundreds of miles from the land. This dust, when subjected to microscopic examination, is found to consist of infusoria and organisms whose habitat is not Africa, but South America, and in the south-east trade-wind region of South America. Professor Ehrenberg has examined specimens of this dust from the Cape de Verd Islands, from Malta, Lyons, and the Tyrol; and he has found a similarity amongst them as striking as it would have been had they all been taken from the same pile. South American are the prevailing forms, in every specimen he examined. This 'rain dust' has been observed to fall most frequently in spring and autumn. Now, at the time of the vernal and autumnal equinoxes the enormous valleys of the Orinoco and the Amazon are parched with drought, and liable to winds that fill the air with dust—impalpable and feather-like remains of animal and vegetable organisms These are swept away by whirlwinds and gales of terrific force, which raise them into the air, whence they are carried across the Atlantic by the trade and other winds." In these organisms, let us remember, is contained a certain proportion of phosphate of lime. Such, then, are some of the modes in which by Creative Wisdom the earth is fertilized; and let us note that the substances thus constantly deposited in small proportions on the soil are precisely those which modern science has introduced so successfully in our great artificial dressings—1st, Ammonia in guano, and in sulphate of ammonia; 2ndly, Nitric acid in the nitrates of potash and soda; 3rdly, Phosphoric acid in bone-dust and in superphosphate of lime. When the agriculturist is applying these so extensively and so profitably, he is merely enlarging a supply of fertilizers, which from the time of the creation has been falling upon the land, treading again in Nature's long hidden footsteps, who is ever grateful for being thus aided. As man thus adds riches to the soil, she brings forth more valuable grasses, and that too without asking the landholder to sow their seeds. These facts, though a puzzle to even the man of science, are well known to every agriculturist. As he manures his pastures, old, coarse, and worthless plants gradually disappear; other grasses, never before seen on the land, take their place, and sometimes in startling profusion. Whence the seed originated, is an inquiry as interesting as puzzling; no one with whom we have to do, doubts the fact that those seeds were brought in some at present inexplicable way, by the birds or the winds. No agriculturist ventures to offer a parcel of verbiage as an *explanation* of such unknown facts. Another truth bears upon the subject of our inquiry. We are all aware that the soil, if unmanured, gradually becomes less fertile; but then we cannot fail to note that the decrease in productiveness at last appears to attain to a minimum; the poorest commons, the most elevated downs still yield a certain crop of grass, although almost everything is carried off from them. There are some very valuable experiments elucidatory of these facts, which have long been carrying on at Rothamsted, by Mr. J. B. Lawes and Dr. Gilbert, who have carried the weight and measure into their experimental fields for nearly a quarter of century.

In some of these the produce of hay per annum from plots of natural meadow land, *not manured,* has been ascertained to be as follows: (*Jour. Roy. Ag. Soc.*, vol. xxiv., p. 30.) In this the weights are given per acre, in tons and cwts.

	Tons.	Cwt.
In the year 1859	1	2½
" 1860	1	4½
" 1861	1	5¼
" 1862	1	7¼
Average of 4 years (1859-1862) ...	1	4¾
Average of 7 years (1856-1862) ...	1	4¼

The only probable degree of uncertainty introduced into these researches was, that the aftermath was fed off with sheep, who would certainly transfer, in some degree, the fertilizing materials from one plot of grass to another. But there are other experiments by the same gentlemen on the continuous growth of wheat on the same land, which do not appear to be open to this objection (*ibid*, vol. xxv., p. 180.) In these the total annual produce of corn was as follows, the return being in pounds weight per acre:—

	lbs.		lbs.
1844	993	1860	738
1845	1441	1861	736
1854	1359	1862	996
1855	1072	1863	1127
Average of 20 years (1844 to 1863)			1026
Average of last 12 years (1852 to 1863) ...			964

We see then, that below a certain amount, the land gives but little indication of ceasing under the most exhausting system of cultivation to produce a crop. The plants it produces, however steadily removing their ingredients derived from the soil, year by year, continue to find a supply, which must be renewed in some way. Now, this renewal of the substance of the plant can hardly be obtained from any other source than the atmosphere.

We have in a recent report of Professors Voelcker and Coleman some practical application of these facts, of considerable value (*Jour. Roy. Ag. Soc. N. S.*, vol. ii., p. 377.) These are contained in a detail of the improvement of grass land on Mr. E. Ruck's farm, at Braydon, in Wiltshire, during the years 1862-63-64 and '65.

The Professors tell us, that "Mr. Edward Ruck bought the Manor Farm at Lady-day, 1862. The estate comprised about 300 acres, with considerable manorial rights, and cost £4,000. Shortly after he obtained possession, we—being then resident at the Agricultural College, near Cirencester—were invited to spend a day in Braydon, Mr. Ruck being anxious to ascertain the condition of the soil, and find out what manures were most likely to prove advantageous. The day was extremely wet, and much rain had recently fallen, so we had an excellent opportunity of seeing the land under the old style of management. We entered the property by a long road, which would be more properly described as a cart-track across high ridges. The oscillation of the vehicle as it rose out of and dropped into these irregularities reminded us of a stormy day afloat; through this we floundered, going on from bad to worse, until at length coming to a standstill, we determined to try our luck, stepping ourselves on terra firma, but we did not then fare much better. The slush and water everywhere were beyond description. One of our first episodes arose from our host slipping up at a gate, and falling flat on his back. However, we trudged on through it all, and were rewarded by seeing more water on the land than we ever remembered to have witnessed."

The soil, in fact (that of the Oxford clay), is heavy and retentive of moisture, or, as the Professors describe it, "Naturally, either like a soapy cheese or a brickbat."

Submitted to chemical analysis, a fair average sample of the unimproved soil, previously dried in a water-bath at 212 degrees Fahrenheit, yielded the following results in 100 parts:—

Composition of Oxford Clay Soil (Unimproved Pasture at Braydon).

Surface Soil, dried at 212 deg.

Organic matter and water of combination...	15.13
Oxides of iron and alumina......................	13.05
Lime	.29
Magnesia...	.26
Potash...	.56
Soda	.09
Sulphuric acid.......................................	.17
Insoluble silicious matter and loss............	70.45
	100.00

The herbage, which in 1862 tenanted the soil in its unimproved state, is thus described:—

"The land was very wet; the herbage wiry, scanty, full of sedges, bent-grass, and a great variety of coarse pasture-weeds. A careful examination of the hay from the unimproved herbage revealed, amongst others, the following plants: Alopecurus pratensis (meadow foxtail), Poa annua (annual meadow-grass)—this grass, which occurs almost everywhere, is very abundant in wet soils, is a common weed on waste places, and has very little feeding value, Poa pratensis (smooth-stalked meadow-grass), Briza media (quaking-grass)—a grass which is of no use in an agricultural point of view, as cattle do not eat it, Agrostis stolonifera (marsh bent-grass), Phleum pratense (timothy grass), Lolium perenne (perennial rye-grass), Festuca duriuscula (hard fescue), bromus mollis (soft brome, or 'lop' grass), Cynosurus cristatus (dog's-tail grass)—a poor pasture-grass, Cardus palustris (marsh-plume thistle)—common in wet clayey pastures, several species of Carex (sedges or carnation grass), Juncus campestris and others of the same family, rushes (generally found in poor wet soils), Ononis spinosa (cammock, petty whin, or rest harrow)—common in barren meadows, Potentilla anserina (silver-weed), Rumex acetocella (dock), Medicago lupulina (yellow clover), and a few plants of red and white clover. The above list, which by no means includes everything, may yet afford a fair example of the complex nature of the herbage, and the prevalence of many plants deficient in nutritive properties, and indicative of wet and poor clays. The hay was wiry, prickly, and void of proper fragrance. On the occasion of our last visit, in the autumn of 1865, we were much struck with the wonderful improvement in the character of the grass-land, and found, in place of a small stock of miserably poor hay, a good store of well-made fragrant hay. Several of the coarser weeds noticed in the herbage of the undrained impoverished pasture had either entirely disappeared, or else the few specimens still to be seen showed a much weaker growth; instead of rushes, we found a fair sprinkling of red, white, and yellow clover, but little carnation-grass. Poor grasses, such as lop-grass, dog's-tail, quaking-grass, and others prevalent on wet clays, had to a great extent made way for more nutritious grasses—such as the better species of Fescue, Poa, and Phleum. On examining the hay, we found few hardheads in it, no cammock, and only a few of the prickly weeds which were before so abundant. Apparently, the herbage had become more simple in character, and the effect of lime and phosphates was clearly visible in the increased proportion of white, yellow, and red clovers, meadow vetchling, and common birdsfoot trefoil. The hay was soft, sweet to the taste, and highly scented by Anthoxanthum odoratum (sweet-smelling vernal grass), and was much relished by stock."

The three chief modes adopted to thus increase the value of the produce were, 1, draining; 2, artificial dressings to the soil; 3, artificial food to the stock. Of draining the reporters remark:—

"The effect of draining grass-land is often less satisfactory than was expected. Many people imagine that it is only necessary to remove the stagnant water, in order to convert a half-starved pasture into a rich nutritious herbage. Nothing can be more erroneous: for a time, at least, the effect of draining is to render land less productive than before. The water-grasses, which have hitherto given bulk, disappear; the mineral riches of the soil are still locked up, requiring the action of the air to set them free, and there is often a decided falling off, or at any rate no visible improvement. Mr. Ruck, however, determined to stimulate the growth of the better grasses by the application of artificial manures, in small quantities often repeated. The soil was deficient, as our analyses show, in lime and phosphates. Bones would have produced a permanent alteration, but bones are costly and slow of action—a mixture of Peruvian guano and superphosphate of lime was therefore used: 3 cwt. per acre, in the proportion of 1¼ cwt. of the former to 1¾ cwt. of the latter, appeared a suitable mixture to produce an immediate effect. This was applied in April, 1862, previous to the draining, distributed through 600 gallons of water, a dilution by which it was conveyed more immediately to the roots of the grasses. The cost of this dressing was 26s. an acre, and the effect was extraordinary. No hay was cut in 1862, but the land was grazed with sheep and cattle eating a mixture of artificial food—that given to the sheep cost 10d. a head per week, and gave a return of 1s. 5d. This was the treatment for the first year. A main artery to receive the drainage of the whole property was cut, and the ditches dug out and deepened. The soil derived from these operations was carefully thrown up into heaps, mixed freely and thoroughly incorporated with quick lime, and allowed to lie for some time, a portion of farmyard manure was afterwards worked in, and thus a capital compost prepared for application in 1863. The grasses, though improved, were still very coarse, and the Devil's Scabious and Cammock, though much weakened, were still visible here and there. In 1863, a similar dressing of artificials was applied in the same manner, the crop was mown and fed; some 25 cwt. of hay per acre was the result, and a heavy after-feed. In the autumn a dressing of ten loads of the compost described above was applied. The drainage was now completed, and the mowing and feeding had tended to fine down the grasses. The change of colour from a dull brown to a lively green, was most remarkable. The live stock looked healthy and thriving, and altogether the face of the country was altered.

"In 1864, the same artificials were again used; and it was intended to feed, and not mow. The grass, however, grew with such rapidity that it was found impossible to eat it down; therefore hay was made, and so excellent was the quality, that a cubic yard weighed, when cut out of the stack, 340lbs.

"In 1865, the last year included in our report, the same artificials were used, and more compost applied; the quality of the produce is now thoroughly good, and the value of the land to rent immensely increased."

Then we arrive at the most important portion of the inquiry—its commercial results; for, as the Professors well remark:

"However interesting the above facts may be in a scientific point of view, the practical landlord and the enterprising tenant will require to know whether all these improvements were profitable, whether a good interest was secured for the outlay in works of a permanent nature, and a fair profit made on the tenant's capital. Unfortunately for the public, Mr. Ruck has not kept any exact and separate account of expenditure and income for this farm: we have to fall back upon a few particulars—from which, however, much may be gathered. Here is one. The last tenant paid 12s. an acre rent. After three years in Mr. Ruck's hands, and, as far as we can judge, without a very extravagant outlay, the grass-land has become worth fully 30s. an acre. The grass-land is about 150 acres: in 1864, 64 acres of this were mown; of the remainder, 27 acres carried 31 yearling beasts all the summer with corn; 22 acres maintained 25 yearlings. There were, besides, 100 ewes which were folded on the ploughed land at night. After mowing, the aftermath was hurdled off with the ewes eating corn.

"The artificial food consists of a well-prepared mixture of several ingredients according to market value, generally barley, wheat, beans, bran, malt-dust, with cotton-seed and linseed cake. The cattle generally received about 4lbs. a day and the sheep 1lb. In addition to the horned stock and sheep, a large number of pigs are fed each winter, generally over 60. The food is mixed up in quantities of 300 gallons at a time, water being laid on to the mixing-tub. Their ordinary mixture of food consists of one part of barley, one of wheat, one of beans, one of bran, and one of malt-dust; of course, a considerable quantity of straw is used besides what is grown on the 150 acres of arable land."

These practical illustrations of the results obtained by men of science are valuable and cheering. They are all in keeping with the conclusions to which nearly three centuries since the great Lord Bacon arrived, who warned his countrymen to examine and follow nature in her teachings; he could see this, though as a great lawyer buried in his chambers in Gray's-Inn, he had fewer opportunities than most men of noting nature's movements. It was 150 years after Bacon's time that from the same Inn of Court, Jethro Tull earnestly pleaded for the same great truths, and applied them more practically than Bacon was able to do, to the cultivation of the earth. Happily for our country, those exhortations did not pass unheeded by the agriculturists of our island: they have long been profitably applied by them; and fortunately for mankind, there is no symptom of this great course of study ceasing to meet with its reward.

THE ENSUING SUMMER:—THE PURCHASE AND GRAZING OF STOCK.

BY A PRACTICAL FARMER.

It must have been manifest to every observer that the price of all farm stock was greatly in favour of the breeder throughout the spring and summer of last year. In some few instances cattle, owing to the dread of rinderpest, were bought at a speculative price, and repaid the grazier remarkably well; but even this was wholly exceptional. However, upon the whole, the grazing of cattle was more satisfactory than the grazing of sheep. Sheep, owing to the high price of wool and the fear of the cattle plague increasing the demand, were enormously dear, and the losses sustained by sheep-grazing in the past season have been very severe—in many cases amounting to from 20s. to 30s. per sheep, the oldest and most experienced graziers denominating it one of the worst and most unprofitable grazing years ever known. To the sheep-breeder it must, on the contrary, have been one of the best years ever known, and compensated in some measure for cattle-plague destruction. Many were the schemes resorted to by ordinary graziers to eke out means, and provide as best they could for the consumption of their grass. Cattle were purchased very cautiously, and in scanty numbers. Sheep became the chief dependence, and, dear as they were, they were freely bought in, and often from sources and flocks not generally in the market. Pigs, too, were obtained in great numbers. Geese even became prominent grazing stock, and that with profit, leaving the rather unusual number of four "pluckings," besides the value of the bird at Michaelmas. Of all the grazing animals of the season, "poor piggy," perhaps, made the worst return. Many farmers bought in large "herds of swine," which they have been feeding upon dear meal and potatoes through the winter in lieu of cattle, and are now selling them as pork at from 4s. 6d. to 6s. 6d. per stone of 14 lbs.

The graziers of the ensuing season, we have every reason to believe, will see the tables turned; and as graziers only, not being breeders, they have every prospect of a profitable year. There is, undoubtedly, a great abundance of sheep; the winter thus far has been highly favourable for sheep grazing, and casualties have been less than usual. The present lambing season bids fair to be one of the most "lucky" and favourable known for many years: in many districts it is nearly over. Everybody is breeding sheep; everybody is wintering an extra number; nobody cared to part with their sheep in the autumn at 20s. to 30s. less than they cost; keeping was plentiful in almost every district, hence flock-masters bought it up freely, and many summer graziers have already large stocks on hand. "Prices" are not yet fixed for the spring, but what sales are made range from 20s. to 25s. per head below last year, and there is every probability of a considerable reduction as the markets open; even the present extremely cold weather will have a depressing effect; wool, too, continues in dull and slow demand at much lower rates, *i. e.*, from 25s. to 30s. per tod below the highest rates; added to this, and it is always of importance in a country like Great Britain, the general feeling of both breeders and graziers and the public universally is, that prices must come down. All has its influence; yes, politics—Reform and Fenian—exercise a certain power for distrust and uncertainty. All agitation tends to disturb business and destroy confidence: bankers are more wary in giving accommodation to their customers; dealers are restrained in their operations; unusual caution is everywhere apparent, hence business is slow and dull, if it be not brought to a dead lock. The cattle plague having reappeared causes much apprehension, and abates that confidence which was in a fair way of being restored. All these matters combined would lead to the conclusion that purchasers will pretty nearly "have things all their own way" this season. Well, they need a turn, and breeders must be prepared to yield it: they have had theirs. I am by no means disposed to croak over these things; farmers are not "going to the dogs" just yet. There will be a good consumptive demand for all their produce, not only during the summer, but in all probability during the next year. But it must be borne in mind that all farm produce has for some time been remarkably high: beef from 9s. to 10s. per stone, mutton 8d. to 9d. per lb., wool from 50s. to 70s. per tod; wheat, barley, oats, beans, peas, potatoes, all at high rates; this cannot be expected to prevail much longer. The first fall will be in the price of meat, indeed it has already commenced. The subsidence of the cattle plague and the abundance of sheep and pork, together with large imports of cattle, sheep, &c., must ultimately have that effect, and if it does not go on to a kind of foolish panic no great harm will be done. Graziers will be able to, and can afford meat at a lower price; and what is equally satisfactory, the public will have no objection to pay a reasonable price for it. The British public as a whole are in a prosperous condition; the rates of interest in our great monied markets testify to a satisfactory state of things in commerce, trade, and manufactures. It is only the great changes that agriculturists must look for, that I am more particularly alluding to, and for which they must prepare. It is quite in accordance with former experience to look for a remunerative price for corn during the summer, and also, as the winter has been a severe one, we may anticipate a far less importation of European produce than usual during the ensuing year, which will, of course, be all in favour of advancing prices here. Upon the whole, I think our farmers may look forward to a good average year of prosperity. The seasons that affect us also affect the corn-producing countries of the continent. We have no stock in hand, and no country has any great quantity to send us; therefore we must mainly depend upon next year's produce.

RIDGING FOR POTATOES.

N.B.—To prevent any misunderstanding or disappointment to anyone, particularly any "Young Farmer," I will again give more fully in detail my own practice of ridging the soil and planting potatoes. I do not break down the land into a finely-pulverized state till it is required for planting, lest it may be run together by heavy rainfall. This it will not do unless finely pulverized too early, and which I am at all times anxious to avoid. In other respects it is properly prepared; but the final harrowings and rollings, &c., take place immediately before ridging, or rather simultaneously with it; for I frequently send the roller, harrow, and ridge-plough in the field together. A beacon is set up where required, at the end of the field. The roll is driven straight across the field to it, followed by the harrow: on their return, ample room is thus made for the ploughman to draw his first ridge. Thus I commence the ridging in changeable weather; but generally I require two sets; therefore I prepare land, and set out some ridges on the previous day, to avoid hindrance, the rolling and harrowing continuing to precede the ridging. Early in the morning the manure-carts are at work, and, taking from three to five ridges, the manure is strewn out of the carts over them as evenly as the workmen can fairly distribute it, followed by spreaders, to draw it all into, and carefully spread it along, the bottom between the ridges, at about twelve cartloads to the acre. The sowers of artificial manures follow, and sow from their little tubs, hung from the shoulder, from 3 to 4½ cwts. per acre of guano and superphosphate, proportionately mixed—2½ cwts. of the latter to 2 cwts. of the former; these again mixed liberally with ashes from couch or brinks, burnt mildly. The planters, who are generally women or competent boys, commence planting along the bottom, and as soon as the first ridge is manured. The length of the field is ascertained; each planter has an allotted length measured and marked out by branches stuck on the ridges, and this length must be planted before the return of the plough, so that all is kept going. A boy or two are usually employed in supplying the planters' baskets with sets from heaps laid conveniently to the work. As soon as the first ridge-bottom is planted the first ploughman commences, and ploughs or turns over about three-fourths of the next ridge upon that bottom. The next ridge-planting commences as soon as he passes a planter, and back again to the mark: the planting is between the one-fourth left of the ridge and the next ridge in readiness for the next plough. Afterwards all is "plain sailing." The ploughmen keep the length of the field between them, so as to give time for the planting. They plough one ridge to cover the sets as they go down on the right of the manure carters and sowers, and open another ridge on the left of them as they come up, so that all goes on simultaneously, *i. e.*, rolling, harrowing, ridging, manuring, sowing artificials, planting, covering-in, and generally the rolling-down of the ridges at last. Our ridges for Flukes are 30 inches wide, and the sets are planted at from 10 to 12 inches apart; for Regents, Rocks, &c., 32 inches wide, and the sets from 14 to 16 inches apart. It takes seven good planters for Regents and Rocks and eight for Flukes to keep two ploughs briskly going. My fold-yard-manure is usually turned over in the yard, and gains by this process a good fermentation without much waste; but the manure from the horse-yard is used directly from it, and is mostly well-fermented. Manure thrown out from "bullock hovels" or byres is generally heated enough for ridge-manuring. The guanos and artificials are well-broken to dust before mixing. Large potatoes are cut into sets: small ones, *i. e.* "seed" and Flukes are generally planted whole, or if full of eyes some are cut out. I commence planting about the 20th March. Last year I planted fifty-six acres: this year I have sixty acres to get in. My sorts are Flukes, Regents, Dalmahoys, Rocks, and Red Regents—the Birmingham prize Reds.

THE CHEMISTRY OF FERMENTATION IN THE PROCESS OF BREAD-MAKING.

The application of chemistry and other of the physical sciences to the arts of civil life is of modern date, and it requires time to bring the merely practical man to see its value. Perhaps there is no business or profession less disposed to accept the services of science in the management of his business than the baker; certainly there is none in which the principles involved in it are less understood. This is readily accounted for, when we consider that the bakers as a body are not educated men; that they have acquired their knowledge from men who themselves practise what they have been traditionally taught, without bestowing a thought upon, or even suspecting the fact, that every time they set a sponge for a batch of bread they are performing a scientific operation of so delicate and precise a character that a few minutes too much or too little is sufficient to spoil the whole mass more or less. Many a batch of bread is thus rendered sour and unpalatable. This occurs oftener than housekeepers are aware of, who ascribe it to the badness of the flour, when, in fact, the best flour is as liable to be spoiled in this way as the most inferior. To know the precise degree of heat required for the sponge in the operation, the exact time for it to remain rising, and the precision necessary in the other operations of bread-making, may be acquired by a clever man in long and careful practice; but even such a man would not be a worse baker if he obtained a thorough knowledge of the scientific principles involved in and regulating the operation.

We have been led into these observations by having our attention directed to a lecture on "The Chemistry of Fermentation in the Process of Bread-making," delivered at the Bakers' Institute in November last, by Mr. Karr Callard. The lecture has since been published, and is sold at the Bakers' Institute, in Rupert-street, the proceeds from the sale being devoted to the interests of the Institution. In this address the chemical properties of the various matters employed in bread-making are described in so plain and simple, and at the same time so scientific a way, that any man of common understanding will be able at once to comprehend them. The experiments and illustrations which accompanied the lecture are interesting and instructive, as well to the housekeeper as to the baker. It is seldom, in fact, that a piece of bread can be produced in a farm or other private house at all equal in lightness, whiteness, or quality to that bought of the best bakers in London. The cause is probably the hasty and unsystematic way in which the sponge is managed, a sufficient time not being allowed for the granules of starch to be properly burst. With respect to the gluten, we think Mr. Callard is under an error in supposing that the millers consider that the *quality* of the bread in respect to *colour* depends on the quantity of that element. It is not *this*, but because the larger the proportion of gluten a sample of flour contains, the greater quantity or weight of bread it will produce. We had an instance of this in the year 1854, when some Russian flour came to London, which, to the astonishment of the bakers who bought it, produced 108 four-pound loaves from a sack of 280 lbs. of flour; the usual number from the same weight of the best town-made household flour being 94 or 96, more commonly the former. The Russian flour was made from the hard Kubanka wheat—as brown and unpromising a material as can be conceived, and that an English miller will only use sparingly, on account of its colour. The best wheat produced in England is the Talavera, which yields a flour at once strong in gluten and of a good colour, and this will always command from 6*s*. to 8*s*. per quarter more than the ordinary white wheat. We have known flour from Talavera wheat to produce 102 four-pound loaves from 280lbs. With regard to the Dantzic wheat, no miller would use it on account of its richness in gluten. It is mixed sparingly, on account of its high value, to impart *colour*, and not for its *strength*, for it possesses perhaps the least gluten of any wheat; but its peculiar delicacy of colour and flavour in bread gives it a value its *weight* would never bestow. With regard to the use of potatoes, Mr. Callard is quite right in exploding the idea that they are used for the purpose of adulteration. Whether in a dear or a cheap year, the price of potatoes is too much on a parallel with that of flour to make it answer the purpose of the baker to use them to the extent of adulteration. We recollect, some years since, a West-end baker being summoned before the magistrate at Bow-street for adulterating his bread with potatoes. He met the charge at once by stating that his customers were chiefly of the upper class, who required *the best bread*, and that he could not supply them with it without using a proportion of potatoes, which imparted both lightness and sweetness. Of course, the case was dismissed, and we have never heard any more of so groundless a charge. It is true, again, as Mr. Callard remarks, that the most inferior—that is, the darkest and hardest wheats — contain the most gluten. They are therefore invariably purchased for the purpose of mixing with the finer qualities, which are commonly weak in gluten. Thus, the Russian Kubanka and the hard wheats grown on the Steppes of Southern Russia are now regularly purchased for that purpose by the English, or, at least, the London millers, who would never dream of using them alone. We have no hesitation in saying that the London bread has been improved in nutritive or flesh-forming properties since the free use of these hard wheats has been rendered available.

The baker will do well to study the chemical part of this little tract. Few of them are aware of the presence of alcohol in bread; still less, that it forms so material an element. A few years since, a Company was formed for the purpose of extracting the spirit in baking bread. The establishment was fixed at Pimlico, near the canal, and it was worked for some time; but it was found that the valuable properties of the bread were injured by the extraction of the alcohol, which made it dry and less palatable; whilst the expenses were too heavy to be covered by the profit on the product, and the Company, after a short trial, was broken up.

With respect to the question of the comparative merits of fermented and unfermented or aërated bread—the latter the invention of the late Dr. Dauglish—we think, with Mr. Callard, that it is a question dependent upon the habit of body of the consumer. In perfect health a person will digest almost anything, and it matters not whether his bread is fermented or aërated; but to one with a weak stomach the fermentation helps digestion by preparing food *beforehand* by one of the branches of that operation. We strongly recommend all, whether bakers or housekeepers, to study this little lecture, feeling assured that it will enlighten them upon a subject which at present is but ill-understood scientifically, even by those whose very business it is to bake our bread.

DEATH OF MR. JOHN ELLMAN.

It is with no ordinary feelings that we record the death of this eminent agriculturist. Born at Glynde, on the 24th of June, 1787, nothing could appear more delightful when Mr. Ellman began life than the prospects of a tenant-farmer on the South Downs. In 1810, when he attained his twenty-third year, wheat was selling just before harvest at 110s. per qr., and in the December of that year the finest samples still made 98s. At the wool fair, too, most of the wool was taken at 3s. per lb. In all this there was no material change until the peace of 1815. As the son of the celebrated breeder, who has been said to have "invented the Southdown sheep," and was with every great agricultural movement in England, the chosen friend of the Earl of Egremont and Arthur Young, Mr. Ellman was from his youth immersed in every variety of agricultural business. During the years of prosperity, however, to which we have referred, if there was more than the ordinary routine of farm-life to attend to, it was of a very gratifying character to all living on the Glynde farm. Mr. Ellman's father from 1790 to 1816 was in the height of a great career. He it was who instituted the Sussex Agricultural Society, and we may add that as long as he competed for prizes both there and at Smithfield, he carried off no small share of the honours. The Duke of Bedford was not unfrequently a visitor at Glynde, and the house was the scene of hospitality as general and munificent as it was hearty and unpretending. We may regard this as the first period of the late Mr. Ellman's life. He was receiving his education at Winchester School, and was originally intended for the bar, but at a very early age he evinced a decided preference for agriculture. In 1810, he left his father's residence to take the farm at Firle, now occupied by Mr. Thomas Saxby, and the Manor Farm, Ripe, the property of Lord Hampden: the latter he held up to his death. On the 25th February, 1811, he married Catherine Springate, the third daughter of Mr. John Boys, of Betshanger, Kent, by whom he had eight children, of whom five sons and two daughters are now living. In 1819, he gave up the Firle farm and took that at Beddingham, since occupied by his brother Thomas, and he then came to reside in Southover. It was from this residence that when the stormy times came that followed 1815, he dated the greater part of the numerous letters which he furnished to *Evans and Ruffy's Farmers' Journal*, the agricultural paper of that day. To all these it appears to have been his invariable practice to append his name. A very interesting period of Mr. Ellman's life was the presentation of a testimonial to him by the owners and occupiers of land. The event took place in 1846. In presenting the testimonial Mr. Tanner alluded to Mr. Ellman "as a warm friend to the agricultural interest, whether it were to preserve to the farmer his rights, or to elevate and reward the honest and industrious labourer," and he added that he was proud to bear his testimony to the zeal and perseverance he had so many years shown in the good cause. If, as a flockmaster, they could not say he had invented a sheep, as a lady did to Mr. Bakewell, he had at least proved himself worthy of being his patentee, in preserving the invention perfect and entire. There were few flocks in the county that had not received some improvement from the Glynde blood, and whose masters had not had reason to feel thankful that they had had the opportunity of improving their sheep by attending the annual sales at Glynde. When Mr. Ellman, sen., retired from Glynde Farm, in 1828, the subject of this sketch became the tenant, and remained its occupant until Michaelmas, 1846, when he removed to Landport, near Lewes, where he has since resided! In 1819, Mr. Ellman was appointed a Deputy-Lieutenant for the county of Sussex, and he was, we believe, the senior member of the lieutenancy. In 1838, he received the commission of the peace from the late Duke of Richmond, and he was always most indefatigable in his attendance on the bench, and in his endeavours to render the pressure of the county taxation as light as possible to the tenant farmer, on whom its weight principally falls.—From the *Sussex Express*.

PARASITES IN ANIMALS.

At the last meeting of the Royal and Central Bucks Agricultural Association, at Aylesbury, a paper was read by Mr. George A. Lepper, V. S., on this subject, who said: I propose that we shall select for our consideration a few of those parasites and parasitic affections that are most frequently brought before our notice. I wish to make the discussion more a practical than a theoretical one; therefore I shall avoid as much as possible the use of technical terms, and deal with the subject plainly and simply, dividing it into three parts, viz.: Parasites that are located on the body, called epizoa; those that are internally placed, entozoa; and those that are sometimes in, and other times out of the body, ectozoa. As a matter of course those that are internally placed will occupy the greater part of our attention this evening, because we, as agriculturists, suffer most from their ravages. We will first take a view of the epizoa, or those that are located outside the body, and the most active of these is the flea. There are about twenty-five varieties of this insect, and we are all aware of the extraordinary agility with which it is endowed. It is said that a flea can jump 200 times its own length, and raise a weight equal to five or six times its own. The metamorphosis which this insect undergoes in its reproduction may not be uninteresting to many of you. The female lays eight or ten eggs, which hatch in about twelve days, and give birth to a larva, which is somewhat of a very small caterpillar shape, thin, tapering, and divided into segments; it has neither legs nor eyes, but crawls like a worm; at its caudal extremity or tail two hooklets are placed, to enable it to retain its position and prevent its falling from the animal while moving about. The larvæ pass on to the third stage called pupæ or chrysalides, and they, by changing their skins two or three times, lose the form of chrysalis and assume that of the flea in active life. The irritation produced by these insects on the skins of some animals is very great, so much so that I have seen dogs brought almost to death's door by its effects. I would recommend those of you who keep fancy dogs to make them frequently sleep on fresh yellow deal-shavings: they will then have no fleas to annoy them. When it is necessary to use any application to the skin, dissolve two ounces of sulphide of potassium in a pint of cold water, and apply two or three times a day.

All animals are subject to the attacks of lice: birds also suffer very much from their ravages. There is a great variety in this class, depending on the animal on which they are located, and at times there are two or three different species to be found on the same animal; but there is a peculiar characteristic appearance about the whole family, with their round heads, flat bodies, and short legs, that after having once been seen they cannot be mistaken. They multiply to an astonishing degree, but unlike the flea they do not undergo any regular metamorphosis: they lay eggs, which are commonly called nits, from which the parasite comes direct, and merely changes its skin two or three times. There are two distinct kinds occasionally met with on the horse, which some of you may have noticed. The larger ones of the two are darker in colour, and are supplied with a rostrum, or sucking organ, which, when introduced into the skin, produces a great amount of irritation. The smaller ones have no sucking organs, but are what are called masticators, feeding upon the exudations from the skin, produced by their own irritation. They lie close to the body, and, when they are numerous, at times are difficult to detect; but if your suspicions are aroused, place the animal in the sun, and the parasites will then quickly come to the surface. Innutritious and insufficient quantity of food, inclement weather, dirty skins—in fact, anything which exhibits poverty, predisposes all animals to attacks of these parasites. I have frequently seen animals that were supposed to be labouring under some serious disease, accompanied with so much debility and prostration that they could scarcely get up when down, attributable solely to the attacks of these parasites. Animals frequently require to be dressed two or three times before these parasites are got rid of, for unless the ova or eggs be destroyed, a fresh batch of young ones will be produced. Infusions of tobacco and mercurial applications are best to destroy these parasites; but in the use of the latter, care must be taken, or serious mischief will frequently result.

The tick is another blood-sucking insect that infects most of our domesticated animals, but principally the dog and sheep. There are many varieties, and are to be met with in all localities, but principally in light, warm, sandy districts, where plantations and woods abound. The peculiarity of the dog-tick is its rostrum, or sucking proboscis, which it inserts into the skin; and, being barbed or roughed, it retains its hold of the animal without any exertion on its part. Its body consists of a large oval sac, in which it can retain large quantities of blood for its future sustenance. The sheep-tick, commonly so called, is a different insect from the foregoing, and passes through a variety of metamorphoses. It is named a pupiparous insect, from the changes it undergoes before leaving the body of the parent. Eggs are laid, larvæ are produced, and they pass on to the pupa or third stage of reproduction before leaving the parent. This insect, although looked upon in this neighbourhood as comparatively harmless, is in some districts very troublesome; and it is of paramount importance that they be got rid of, both as regards the comfort of the sheep and the pocket of the owner. Sheep-dipping is universally admitted to be the most effectual, as well as the most economical, mode of getting rid of these and all other epizoa that attack sheep, not forgetting the acari, which cause the disease known as scab in sheep, the itch in man, and the mange in horses and other animals. Various formularies have been advocated for dipping compounds. They may be divided into two classes—vegetable decoction and mineral solutions: there is much less danger to be apprehended from the use of the former than that of the latter; for some short time since we were constantly hearing of deaths occurring either to men, horses, cattle, sheep, or pigs, through the carelessness of those who had the care of the dipping apparatus, or by inadvertently throwing the solution, after being used, into a ditch to which the animals had access; but I am pleased to say that these matters are better arranged now than formerly. The vegetable decoctions are principally derived from tobacco, henbane, hellebore, and digitalis, or foxglove; and the active agent in most of the mineral solutions is arsenious acid. There are also compounds in which carbolic acid takes a leading part; but not having used it myself, I am unable to form an opinion of its value; but, whatever the formulary may be, the compounds of sulphur ought always to enter largely into it.

We will now turn our attention to the entozoa, or those parasites that are internally located; and the extraordinary changes which some of them undergo is truly surprising. I have selected a few that are most interesting. We will first take the Distoma hepaticum, or liver fluke, with which I am fearful that many of you will shortly be too familiar, having had a few cases of rot brought to me already. This disease is less frequent in the attacks than formerly, consequent on the improved state of agriculture, deep draining, &c. About one hundred years ago the sheep in this Vale were visited with a very severe attack of rot, and there have been many outbreaks since; but at that time some farmers lost the whole of their flocks; and it is said of others that they lost two flocks during twelve months, and many persons were entirely ruined by it. At Stewkley—or, as it was then called, Stutely—a farmer drove the whole of his flock, consisting of 100 sheep, to Leighton Buzzard market, and sold them at 6d. per head, rather than have them back again, and see them die. I venture to say that at that time store ewes, if sound, would not have made their £3 and £4 a-head, as in the present day. Flukes, I need scarcely say, are generally found in the biliary ducts of the liver, but they have been discovered in nearly every part of the animal tissue; they are hermaphroditical, both sexes being combined in one insect. When matured they lay large quantities of eggs, and these pass from the liver into the alimentary canal, and are eventually cast out with the egesta, and it is away from the parent, if I may so term it, that the great metamorphoses of these parasites take place. During their transformations they are to be met with in most stagnant waters, ponds, and in all low wet situations. There are supposed to be about 400 kinds of fluke, and they are widely distributed, being found in birds, fishes, reptiles, and in all animals—more abundantly in those that ruminate. The egg of the distoma or fluke gives birth to an embryo, in the interior of which is developed an organism called a sporocyst or germ sac, and at its first separation from the embryo no distinct form can be traced; but very quickly after, the head, body, and tail can be distinguished, and in a short time another organization called "Cercaria," from its tail-like appendage, may be seen within the cavity of the body in an advanced state of development. Now, gentlemen, you must see that this is an extraordinary change, for here "like does not produce like." This great discovery was made by that distinguished Danish naturalist, Steinstrup, and he calls it an alternation of generation, which he says is the remarkable phenomenon of an animal producing an offspring, which at no time of its life resembles its parent, but which on the other hand itself brings forth a progeny which returns in its form and nature to the parent animal, so that the maternal animal does not meet with its resemblance in its own brood, but in its descendants of the third and fourth degrees of generation. You will excuse me thus digressing, but the subject is fraught with so much interest that I could not refrain from drawing your special attention to it. These cercariæ, very quickly after they leave the sporocyst or germ sac, attain their full development. As soon as this is completed they part with their tails, and locate themselves within the body of some aquatic insect, where they remain dormant. This constitutes the pupa or third stage of the fluke, and it is at this stage of its development and by this means it is conveyed into the body of some higher order of animals, there to be fully matured into the adult fluke. I have thus shown you its life cycle; and being so diffused on the face of the earth, you may naturally ask how it is that other animals are less liable to its attack than sheep. It may be presumed it is because the sheep bites its food close to the ground, where the penultimate form of the fluke abounds in wet, warm seasons, and, being a ruminating animal, these encysted cercariæ may remain in the rumen, or first stomach, for a long time, and are not there subject to the action of the gastric juice, which, I believe, destroys a vast number when taken into the stomach of non-ruminating animals, and this will account for horses grazing without risk in pastures that are certain to rot sheep. To produce rot we must have a great amount of moisture with an elevated temperature, and then millions of these cercariæ come to perfection which would otherwise remain dormant or decay. It is stated that sheep fed upon the salt marshes never take rot; and this I believe to be true. And why is it? Because the penultimate form of the fluke cannot live there. No eggs, no embryos, no sporocyst, or germ sacs, no cercariæ are to be found here. The earth, and consequently the herbage, contains so much saline matter that if placed there they do not come to perfection, but die. Now this precept from nature teaches us a most important lesson—how, in a great measure, we may prevent sheep from being affected with this disease. If any of you hold lands that are likely to produce this disease, have your sheep located on the highest and driest parts of your farm: have them folded every night, and feed them with dry succulent food, with which mix a moderate quantity of common salt. This will in a great measure prevent the formation of flukes by destroying them in their early stage of development. I have no hesitation in saying that by allowing sheep to feed for one hour on some situations, sufficient amount of mischief may be done to produce "the rot." Take care of your sheep, and prevent them as much as you possibly can from taking this disease; for remember this, that when once it is generated there is no cure. Palliative measures may be adopted in the early stages with considerable benefit; but when once a rotten sheep, always a rotten sheep. I have gone somewhat more minutely into this disease than others, on account of its great importance. I hope you have not thought me tedious.

It is estimated that there are two hundred different species of the tape-worm. They are easily distinguished by their elongated flat bodies being divided into several joints or segments. The head is furnished with suckers, so that it can hold to the intestines of the animal in which it may be placed. This parasite is very widely diffused, and has been found uniformly distributed throughout the animal kingdom; it may be said to form a colony in itself, for every joint or segment is supplied with reproductive organs. These segments are called zooids, in which eggs are formed and embryos are developed. Before it leaves the body of the worm, these zooids pass out of the animal with the egesta, and then have an independent existence; but it is of short duration. By the growth of the large number of embryos it contains, it soon bursts, and the embryos are thus scattered in all directions. After a time pigs, dogs, or some other animals get them, being mixed with their food, into their stomachs, where some remain; but others bore their way through the animal tissues, and locate themselves in the fatty parts of the body. Should it be in that of a pig, we get what is usually called "measly pork," and the parasite is now named "cysticecus cellulosæ." This meat, being eaten by man or some animal in an imperfectly cooked state, replaces them in their natural home, where they again become fully developed into the tape-worm. Many of you have noticed those little bladders of water as they are called, situated in different parts of the body, more particularly on the liver and lungs. They are "hydatids," and are also products of the tape-worm; and if taken into the body or intestines of other animals again asume their primitive form. Thus, I have given you a very short account of the development of the tape-worm; and as I am aware that in some localities these parasites are a great annoyance to the flockmaster on account of the injury they cause to his young flock, and knowing how subject the dog is to these insects, consequently a great distributor, I would suggest that he be allowed to remain near the flock as little as possible, and his food ought always to be well cooked. Various medicinal agents have been recommended for the destruction of these parasites, such as the root of shield fern, the seeds of the pumpkin, the oxide of silver, &c.; but I know of nothing more effectual than the various preparations of turpentine, in conjunction with mineral tonics; and I perfer those of iron, because it enters very readily in the composition of the blood, thus giving additional tone to the system.

Nematoda, or round worms, in many instances very much resemble in their outward appearance the ordinary earthworms, but their inward conformation is very different. They, like the tape-worm, deposit eggs, and the migratory system, as it is called, takes place. They leave the parent stock, become attached to water insects, &c., and are again returned to their ultimate distination. They are to be met with abundantly in the intestines of all carnivorous animals, also in the horse, cattle, sheep, and poultry. It is stated that there are 800 species of these parasites, but Cobbold reduces them to 550. Each species is generally met with in its own peculiar situation. Thus we have the ascaris lumbricoides in the small intestines of horses; ascaris vermicularis in the large intestines and blood vessels, strongylus filariæ in the bronchi and air passages, also in the eyes of many animals, and thus we might go on *ad infinitum*.

The filariæ bronchialis, or worms in the air passages, are met with in most animals, and are a source of great annoyance and loss to farmers. They, "like the tape-worm," are introduced into the system principally with the food and water; by some helminthologists they are supposed to get to their destination through the cirulation of the blood; by others, during respiration; but I have no doubt they follow the laws which govern the generality of the "nematodæ." We find that young animals are more subject to their attacks than older ones, and that generally during the first year of their existence. Ruminants are most susceptible, but we do find them in other subjects; for instance, in poultry they are very destructive, producing in them that disease known as "the gapes." During the winter of 1865 and the spring of 1866, many thousand tegs were lost in Romney Marsh alone, through these parasites, and many other places were equally unfortuate. The great question is—how are these attacks to be avoided? I believe that calves weaned early, liberally fed, comfortably housed during the winter, and not early depastured in the spring, so as to check that gradual improvement and development of the system which has been going on, will so fortify the animal against these attacks, that they will often pass over unnoticed; but should they make their appearance they will be more subject to remedial measures, and the great losses which are sometimes sustained will be avoided. Various have been the suggestions for the destruction of these parasites, such as the inhalation of gases, tarring the animal's nose, physic and bleeding, large doses of sulphur, &c. ; but we must have recourse to those powerful anthelmintics, the compounds of turpentine and mineral tonics, not forgetting a liberal diet, and these should be resorted to in the early stage of the attack, before the parasite becomes fully developed ; it is then more easily destroyed, and there is not that great debility produced in the patient which often requires weeks or months to counteract.

The œstrus or gad-fly has the appearance of the ordinary large fly, but the body is frequently ornamented with various colours, and in many of them is covered with hair. They deposit their eggs on the bodies of animals, and each species attacks its own peculiar quadruped. Thus we have the œstrus ovis, or sheep fly ; œstrus bovis, or cattle fly ; and œstrus equis, or horse fly. The changes which these parasites undergo are peculiar.

Most of you have noticed the little yellow deposits on the hair of horses when at grass during the summer, placed more particularly about the forelegs and shoulders. These are the eggs of the œstrus equis. After remaining there a few days the larva is hatched, which by its motion produces an itching sensation, which causes the horse to nab or bite himself ; by this means it is taken into the horse's mouth, and passed on into the stomach, where it becomes attached by means of two hooklets, between which its mouth is placed, and there it remains until the following summer, when it releases its hold and passes out of the body with the egesta, in which it continues for a few weeks, and assumes the pupa or chrysalis form, the outer form being hardened by exposure. The fly bursts from its confinement, in a few hours takes wing, seeks its mate, eggs are again deposited, and thus the perpetual circle is kept up.

The œstrus oovis follows the same metamorphosis, but is not taken into the alimentary canal. Eggs are deposited in the skin, on the backs of cattle, which accounts for the great excitement the gad-fly produces among them. The larva is produced and remains until spring, suppurative action is set up, the hole by which it entered enlarges, they fall out, assume the form of chrysalis, this bursts, and another fly is the result.

The æstrus ovis deposits its eggs within the nostrils of sheep, which causes them during the summer to congregate and hide their heads under each other, so as to resist the attack of these insects. Embryos are produced, which find their way into the frontal sinuses, where they remain their appointed time, become removed, and eventually form flies again. The larva of this insect was at one time supposed to penetrate the central cavaties, and cause giddiness, sturdy, or turnsick, as it is called; but we now look to the cysticercus or hydatid state of the tapeworm to produce this disease.

And now, gentlemen, I beg to thank you for your kind attention. I feel that I have given a very imperfect glance at this most important subject : I wish it had fallen into abler hands ; but I have performed my promise, in making which I may have done wrong, but in not attempting its fulfilment I should have done much worse.

Mr. J. W. Griffin asked whether Mr. Lepper thought sheep were as susceptible of fluke in a mild season as they were in a wet summer. He had always understood that there was very little danger of rot in sheep after Michaelmas.

Mr. Lepper replied that after Michaelmas they generally looked for cold weather, and at that time the penultimate form of fluke was destroyed. To bring it to perfection required an elevated temperature, though he could not tell the precise degree, as well as moisture. Animals which had not taken the rot before the snow would not afterwards.

Mr. E. Freeman said that, having lost a great many sheep in his time, from parasites, Mr. Lepper's paper was to him doubly interesting. In the course of seven or eight years he had lost two or three flocks of sheep from rot. On one occasion he happened to have his cull ewes put on some swede ploughing land, in November, and they were as sound as they could be ; his store ewes ran over the grass fields after November, and kept on them all the winter, and proved rotten. Now, these ewes must have rotted after November. In his opinion it did not matter what the season of the year was, provided there was wet land. He had not an acre of flooded land on his farm, but only wet clay land where the water stagnated in the furrows and was covered with a green scum, and the grass grew through it. Those were the circumstances under which sheep would rot, no matter what season of the year it might be. As to the tape-worm, he had heard it stated that it was produced from the fluke ; but Mr. Lepper did not mention that as a fact. He (Mr. Freeman) supposed it was not so. He had lost nearly one-half of his lambs one year from tape-worm, and no remedies that he applied were of any avail. He had seen a tape-worm at least six yards in length brought out of a lamb, all in one piece. When they got these parasites in almost endless numbers inside of a sheep, they knew what the consequences must be. In his opinion nothing would prevent their doing mischief more effectually than a generous diet given to them in the younger period of their growth. With regard to parasites in the lungs of animals, he might say the same. Calves were more subject to the disease than other animals ; but he would say, keep them on dry food from the August until October, and you will not have very much husk. He believed a generous diet was the main preventive of these diseases.

Mr. J. K. Fowler asked if Mr. Freeman's land was drained at the time he mentioned, when the water stood up in furrows.

Mr. Freeman replied in the negative. There was no doubt that draining was the principal cure in that case.

Mr. Treadwell asked if Mr. Lepper considered that rock-salt, continually used in troughs for sheep to run to at any time, was as good as giving them common salt, as a preventive of the rot. He scarcely agreed with Mr. Freeman as to the husk in calves. His own opinion was that the husk in calves was not always occasioned by parasites. From his experience he was led, with Mr. Paxton, to say that, combined, they could combat that argument pretty strongly and confidently. Fortunately, he had not had much experience in sheep rot. When he lived at Westcott it was a wet season, and he sold some lambs to the butcher, and it was found there was something the matter with them. They had taken the rot, but not to a great extent. But his store ewes, bought in September, and kept on the driest part of the farm on a good supply of dry food, were not affected. He would like to know whether, as they were having now-a-days something like spring or summer weather, they were quite safe where they had very wet land, very wet herbage, and very mild temperature. Mr. Lepper's paper must be accounted "A 1" in the series of papers that had been read during the present season. He therefore had pleasure in moving a vote of thanks to him for his excellent paper.

Mr. J. K. Fowler seconded the motion. Having been a serious sufferer from sheep-rot, he could say that it was a matter of the deepest importance to them not only individually, but to the whole public at large. They had had recently a remarkable season. Indeed, they had had two seasons of excessive rain—from about last October twelvemonth to the present time. There had scarcely been a dry fortnight, and it behoved them all to watch with the greatest care their flocks. When the rot in sheep was very prevalent some time ago—

Mr. Lepper : In 1860 ?

Mr. Fowler : It was in 1853. He unfortunately lost a whole flock of 100 ewes. He sold 70 otherwise valuable tegs for £40. He used to go into his sheepfold in a morning and see, out of 120 of them penned on swedes, six or eight or ten of them dead. This went on daily. The disease was so insidious in its advances, that young farmers could not count its effects until the whole flock was destroyed. He mentioned this to show that Mr. Lepper was right when he said that when sheep once had the rot it was impossible to eradicate it. It would have its course and destroy the animal. That year he lost from £300 to £400 worth of sheep. He was therefore indebted to Mr. Lepper for bringing forward this subject. It behoved them to look carefully to the methods by which they meant to tend their flocks next year. He firmly believed that the basis of prevention of the disease was deep drainage—a thoroughly drawing off of the water from the land. Mr. Freeman had said that the green grass grew through the green film which lay in the furrows ; and he (Mr. Fowler) believed that was one cause which generated parasites. The damp situation had something to do with it. He thought there was much justice in Mr. Lepper's remark as to the impoverished state of cattle. This was the case with the production of the louse. So it was with the human frame ; the poorer the person or the poorer the district, the more general they would find the state of the inhabitants usually called "lousy." Then, as he had had some experience in poultry rearing, he would say it was of equal importance to look at the poultry-yards. Mr. Lepper had mentioned parasites in fowls. They all knew how fowls loved to get to a bit of dust, and would dust their feathers, and if they could find lime or ashes, how they would dust themselves. But they understood what ashes meant, and that they were perfect preventives of the flea and the louse. As to gapes, thousands of chickens and turkeys were lost from that cause. It was a small worm; and it was thought that by passing a small feather dipped in turpentine down the throat it would draw up the worm. But the worm did not exist there; it was to be found in the air-tubes, where it was generated.

Mr. Treadwell: What is your remedy?

Mr. Fowler replied, A feather with turpentine, but that did very little good. Mr. Lepper had alluded to the use of salt. He (Mr. Fowler) thought it was of advantage to lay salt in the fields, in the feeding-houses, &c., for their animals. They scarcely knew how fond they were of it, and how they licked it up. They knew, in fact, better than their owners what they wanted. As a practical turn to the paper he would ask them to see what they could do by putting rock-salt especially about their fields.

Mr. E. Terry, Sen., said that on one occasion he bought twenty long-nosed pigs at Leighton. They were very poor; he fed them on spent hops, and they gained remarkable flesh. But those hops constipated them, and he was told to give them common salt. This was given in large quantities, and it produced inflammation of the throat. As to poultry, he had tried to cure the gapes, and he had actually brought up the worms by means of a sponge and vinegar; and he got the birds to live, some of which cost him not less than £15. He did not think that the feather would do alone. (Mr. Fowler: "I think so too.") There should be great precaution in giving salt to pigs. That was what he wished to impress on all present.

Mr. R. Fowler asked how many pigs Mr. J. K. Fowler lost on one occasion by giving them brine.

Mr. J. K. Fowler said when he referred to the use of salt he alluded to its use for cattle and sheep in the field, and not for pigs. He was aware that nothing would kill pigs sooner than salt. He once had a brine tub, the contents of which got emtied into the hog-tub, and the result was, it killed every pig he had. Salt was especially good for pigs after they were dead (laughter).

Mr. H. Lepper said with reference to animals dying with what was called the worm in the throat, he had lived long enough to disbelieve one-half of what he saw, and to be very sceptical as to what he heard. Mr. Treadwell lost several in the state which was usually called a congested lung; and when they came to look for the worm, none was found. Experience taught that young animals were not all liable to the parasitical deposit of worms. Mr. Treadwell forgot to say that when his calves were treated, the same complaint had attacked his cows. His experience enabled him to say, "Take no notice, for I never knew the trachea worm in adult animals to produce any mischief." They were disappointed in not finding the trachea worm, but he thought their investigations were not carried far enough. The probability was that if they had had the microscope they would have discovered the germ of the trachea worms, perhaps sufficiently numerous to account for the congested state of the lungs; and when that excessive irritation was set up and an increased respiration and coughing resulted, it would have been sufficient to account for it. Much had yet to be learned in these matters, and people were too apt to take effects for causes. He hoped the present discussion would be of good effect.

Mr. W. H. Rose asked if the little eggs taken into the stomachs of horses, as mentioned by Mr. Lepper, would cause inflammation in the horses, through the horses taking in too many of them.

Mr. G. A. Lepper replied: He said the fluke-worm was very distinct from the tape-worm, so that Mr. Freeman attributing the disease in his sheep to the fluke or to the rot was simply a mistake. As to the sheep taking the rot, they would always find it where there was stagnant water. Running water did not produce it. As to the length of the worm, as mentioned, that put him in mind of a story in which a man was said to be known to suffer from tape-worm; that man had an emetic, a surgeon was in attendance, and there was brought up a portion of a tape-worm, measuring thirty-two yards, and one piece was broken off, and it was related that the surgeon thought the man was bringing up his intestines (laughter). As to the rock-salt being placed in the fields, they all knew that salt, taken when unmixed with anything else, produced a great amount of saliva; and from the conformation of the stomachs of ruminant animals, most of the fluid passed by the *rumen*, where the penultimate from the flukes were situated; so that it was not half so effective out in the field as ordinary salt was in the stomach, where it was brought always into contact with the parasites themselves. As to the husk in calves, that was obtained from a variety of causes. Let them not imagine, whenever their cattle coughed, that they were suffering from parasitical affections. As to precautionary measures for sheep, and the time when they would and would not take rot, he thought it was advantageous to use all precautions should the weather continue mild, and they should remove them from their retentive clay soils at once. With regard to Mr. Terry's observations as to pigs, when they were alive they could not bear to be salted (laughter). Kill them first, and then they would take the salt well (more laughter). If overdoses of salt were given, inflammation would ensue. There was much sympathy between the stomach and the brain, and if they gave them brine in the hog-tub, disease would be induced. Referring to the gapes in fowls, he thought Mr. Terry's plan was preferable to Mr. Fowler's, inasmuch as the sponge contained a larger quantity of turpentine than a feather could. It was the turpentine that would cure the gapes. As to the botts, they were formerly looked upon as a distinct parasite, but it had been proved that they were the larvæ of a fly. The horse's stomach was divided into two parts, 1, cuticular, and 2, mucous; and they seldom found the botts attaching themselves solely to the former coating of the stomach, and not to the sensitive coating. In some cases they had been known to penetrate the walls of the stomach and produce death. This, however, was very rare indeed.

The vote of thanks to Mr. Lepper was carried, and the meeting ended with a similar vote of thanks to Mr. Crouch for presiding.

THE FUNCTIONS OF SMELL AND TASTE IN CATTLE.

Writers on natural history, ancient and modern, are unanimous as to the relation that exists between the smell and taste of herbivorous animals and the odorous and sapid properties of the plants they select for food. In the olden time the subject was closely examined experimentally; hence, in the works of that period, authors in giving a description of a plant noticed also the animals by which it is eaten, and by which shunned as repulsive to the organs of smell. Thus, at that time, the natural food of the horse was recorded and shown in many instances to be very different from that of the ox and sheep, and so on for different kinds of cattle. Nor were experiments confined to vegetable food; for we are told (quoting from "Todd's Cyclopædia," article Smell) that "Galen placed a newly-dropped kid near three vessels—one filled with milk, another honey, and another with wine. After smelling at all three, it presently began to drink the milk." Bacon, who was well versed in the writings of the Greek and Latin authorities on the subject, says in his Natural History (Century X., experiment 934), "It is certain that odours do in a small degree nourish." And long before his time, Hippocrates taught his pupils in reference to taste that "An article of food or drink which is slightly worse, but more palatable, is to be preferred to such as are better, but less palatable." And of modern writers we shall only mention Arthur Young, Esq., who, in his "Farmers' Calendar" (1809), under June on hay-making, page 366, places the odorous and sapid properties of hay as being synonymous with its nourishment and value. Thus, referring to the "third-day's" work, he says, "In this method there are three operations every day, which are more essential in hot burning weather than in a wet season. If the hay is moved only twice in a day, the same surface will be exposed six or eight hours to the sun, which will damage it almost as much as rain. The great object is to move it so often, that the sun shall not have power to extract so much of the sap as to change entirely the colour of the hay, upon which also depends *its scent and nourishment*. There are many plants gathered for their physical virtues, which would be good for little if not dried under cover. The finest green hay is made when there happens to be a dry season with very little sun. The common farmers are perfectly contented to let a burning sun shine day after day on their hay, and think themselves happy in carrying home hay with neither scent, colour, sap, nor value."

The reader who has studied the odorous and sapid properties of hay in the field in hay-harvest, as Arthur Young, Esq., did, and the manner cattle relish and thrive upon well-made hay, in comparison with what they do on the insipid, scentless, burnt-up fodder referred to in the concluding sentence of the extract, will readily comprehend the soundness of the practice followed by the author of the "Farmers' Calendar," and the *rationale* of the general doctrine taught. In referring to the practice of harvesting medicinal plants, which are for the most part dried in the shade, and to the superior quality of hay made under a drying but cloudy atmosphere, when the burning rays of the sun are intercepted, Mr. Young cannot be misunderstood; for, as practically argued by him, it is a well-authenticated fact that the odorous and sapid properties of the hay and of the medicinal plants are those proximate principles that are removed by the action of the sun in both examples; and it is equally manifest that he placed a very high dietetic and nourishing value upon the presence of such properties in the hay, and that when deprived of such properties by mismanagement or otherwise, the hay becomes comparatively worthless food to cattle. And what is true of hay is also applicable to all other kinds of harvested fodder, as the straw of wheat, barley, oats, peas, beans, tares, clovers, &c., &c. Under each of these feeding materials, the author of the "Calendar," we repeat, advocates the importance of their odorous and sapid properties in unmistakable language.

Smell is the sense by which we distinguish one odour from another; and taste, the sense through which we take cognisance of the sapid properties of our food. Both senses are capable of cultivation, and this is probably one of the chief reasons why they are more active in the lower animals than in man. On the other hand, they are capable of being greatly blunted by neglect, mismanagement, or force of habit.

Natural history furnishes many interesting examples of the cultivation and neglect of smell and taste. Thus amongst some savage tribes who cultivate smell from infancy, the scent is so keen as to detect the path of another tribe; so that it becomes nearly as active and sensitive as in the case of the pointer or the shepherd's dog, which we have seen go into another flock of 1,000 sheep and bring out an individual of its own fold. The organs of smell are also very sensitive and easily impressed in people that are born blind, deaf, and dumb. Numerous examples of this kind are recorded, one of which we quote from *Todd's Cyclopædia of Anatomy and Physiology*—viz., the case of a James Mitchell, deaf, dumb, and blind from birth, in the article under "Smell," already mentioned, and written by Dr. Carpenter: "In selecting his food he was always guided by his sense of smell, for he never took anything into his mouth without previously smelling it carefully." He knew his clothes by their smell, and also his friends and acquaintances from each other. He once had his eyes examined by a medical man, and in coming near to the same physician some time afterwards, he at once recognised him, and by signs pointed out to his guide that he was in the presence of the doctor who examined his eyes. Again, those engaged in tasting tea, wines, and other spirits, &c., furnish a striking illustration of the cultivation of taste. As to neglect, the age in which we live is one big example, both as to food and drink, every rank and class of society presenting diversities that can only be accounted for by the force of habit, &c.

Amongst our cattle the same laws of cultivation and neglect of smell and taste are exemplified. Thus we see animals fed on natural food healthy, active, and keenly scented; but in a domesticated state they are, by the force of habit, trained to eat many things they would shun, were they left the freedom of choosing for themselves. And this conclusion is equally applicable to the horse, the ox, the sheep, and the hog, their food and senses in each case being abnormal, generally speaking, and consequently their health in a corresponding state.

"The study of the *laws* by which the Almighty governs the Universe is our bounden duty." Of the many golden precepts taught by the late Prince Consort in his public speeches, this is one of special value (Birmingham, Nov. 22, 1855), and its application to the subject before us cannot fail to come home to every intelligent stock-breeder and feeder with a force that must carry conviction before it; for instead of cultivating smell and taste either in themselves or their cattle, they are following the opposite course, and, as is always the case when the natural laws are thus set at nought, they are consequently experiencing the just retribution due to disobedience, and from which there is no exception.

The loss sustained from bad food and unhealthy cattle will be better understood by practical men when the facts of the case are recognised by them. At present too many are like the farmers referred to by Arthur Young—"happy" to follow the example of others, who neither exercise their own organs of smell and taste, nor think that their cattle should be otherwise trained in accordance with the established Laws of Nature.

The first step, therefore, in getting out of this unfortunate state of things is to comprehend in a practical sense the natural law thus violated. What is it in reference to smell? and what as regards taste? It is an acknowledged fact that the odorous and sapid properties of plants are tangible substances, that can be seen and handled, were they isolated by chemical analysis, and examined apart by themselves. Such being the primary conditions of the question, what effect do such substances produce upon the organs of smell and taste? And what purpose do they serve in the animal economy, when taken into the system along with the other elements of food?

These are questions involving considerations of a two-fold character, neither of which is as yet sufficiently understood to permit of a satisfactory solution. Thus, on the one side, our knowledge of the functions of smell and taste is very limited, the details of the subject being as yet surrounded with much controversy. One of the best authorities of the current period defines smell and taste, in his public lectures, as two chemical processes, the former catalytic, and the latter dialytic. It is also now generally admitted by physiologists that the nervous system has more to do in the various processes of the natural laboratory than is yet understood, and that the chemical action of the nerves is called into operation, if we may so speak, through the instrumentality of the odorous and sapid properties of the food ingested. On the other hand, very little is yet known about odours and savours. Attempts have been made by Linnæus, Boerhaave, and others, to classify the sapid properties of plants, which all agree to consider primary, such as the aromatic, sweet, acid, bitter, saline, astringent, and pungent; but the first, the aromatic, calls into action the olfactory nerves as well as the gustatory; while the last two—astringent and pungent principles—affect the organs of touch as well as taste. In other words, the action is mechanical as well as chemical, the sense of touch being mechanical (Todd's Cyclopædia). Again, the late Professor Henslow in his "Physiological Botany" under "*Taste and scent of plants*" says: "It will readily be conceived that the peculiar taste and odours met with in different species must depend entirely upon the nature of the various matters which are secreted by them. Attempts have been made to classify the various impressions which are thus made upon the sensorium, and odours have been arranged into classes, under the terms aromatic, fœtid, acrid, alliaceous, musky, &c. Such classifications at the best are highly empyrical, and any arrangement which could be founded on an accurate knowledge of the chemical nature of these substances would be far preferable; but our extreme ignorance on these points will not justify the attempt at present."

Although the data above quoted from the best authorities of the day are not so flattering as could be wished, yet the progress now being made in animal and vegetable physiology is nevertheless sufficiently encouraging to call for the practical co-operation of the agriculturist. No doubt it has been said by very high authority with much truth that the newly introduced terms of catalyis and dialysis "are ill understood, and we are content to hide the imperfection of our knowledge under a sounding name" (Ure's "Dict. Arts." by Hunt). But granting for the sake of argument that these chemical processes or phenomena, whatever they may be, are not well defined, it is nevertheless manifest that they furnish a certain exposition of fact in natural chemistry, the soundness of which cannot be gainsayed, and that as we advance in the march of discovery every day is throwing more and more light upon the matter. The subject is one of experimental inquiry, and it often happens in such researches, as in political ones, that "coming events cast their shadows before them," for in chemistry the presence of new processes or things is often indicated before the processes or things themselves can be individualised.

But, besides the impressions made upon the olfactory and gustatory nerves by odours and savours, and the nervous action induced, whatever that action may be, both classes of properties possess certain medicinal qualities that have been known to the medical world from time immemorial. And many of these medicinal proximate principles ,both odorous and sapid, are essentially necessary to the healthy performance of the digestive, assimilating, and excretory processes. It is, for example, a well authenticated fact, that iron, sulphur, and common salt are essentially necessary to the formation of blood, tissue, &c. And the food of cattle must not only supply these in sufficient quantity, but also in an available form. And, besides these, there is an indefinite number of other substances, of which very little is yet chemically known, whose presence in the food of cattle is absolutely necessary to the normal performance of the above processes, and without which, or some equivalents for them, animals cannot maintain health, or render an economical account of their food. And what merits special attention is the fact that odorous properties not only enter the circulation by the absorbents of the alimentary canal, but also by the respiratory organs, the air inhaled being always loaded with the aroma of the herbage on which cattle feed, so that its action is of a three-fold character: First, upon the mucous membrane of the air-passages; second, upon the blood; and third, by the sympathetic relation of the nerves of the respiratory with those of the digestive organs, &c., and these are unquestionably in accordance with the natural law of smell.

There are thus on both sides, in the animal kingdom and in the vegetable kingdom, an indefinite number of odorous and sapid properties, of which comparatively little is yet known from a chemical point of view, only a very small proportion of the whole having been isolated by analysis. Medicinally, experimental inquiry has made further progress; but even here much remains to be done before definite conclusions can be deduced as to the peculiar purpose they serve in the animal economy when in a state of health, experiments with medicine having been chiefly performed under abnormal conditions of the body, in the lower animals as in man; whereas, farmers require to know what purpose they serve when their cattle are in good health.

In some cases the peculiar function of certain proximate principles depends upon the quantity contained in the food. Thus, for example, certain available compounds of sulphur are in small quantity used up in the formation of blood and tissue: in a large quantity they are stimulating diaphoretics; and when given in still larger doses and in a less available form, they are aperient, and even strong purgatives. Common salt is tonic and anthelmintic in small quantity, but emetic and purgative in larger. Iron, again, when given in supply suitable to the demands of the system, is tonic; but when given in excess, as it sometimes is in clovers, pea and bean straw, it is powerfully diuretic. And it is more than probable that most other of the medicinal principles of the food of cattle comprised in the odorous and sapid properties are somewhat similar in their action, according to the quantity given, and how far they are available, or in accordance with the established laws of Nature, as to quality.

In prosecuting this inquiry experimentally, it therefore follows, from the preceding observations, that farmers have, in the first place, to make themselves thoroughly acquainted with the odorous and sapid properties of the natural food of their cattle; in the second place, to ascertain how far the feeding materials, being given under artificial management, accord with the requirements of Nature; in the third place, to inquire how far the deficiency of odorous and sapid properties, produced under the second head, can be artificially supplied from the natural resources of the vegetable kingdom.

In this threefold task, the first and last duties are occasioned by the second—the manifest deficiency of odorous and sapid properties of a normal quality that exists in the feeding materials upon which cattle are now fed. There may, no doubt, be a few exceptions to this general rule, as will be found in the sequel; but, in the vast majority of cases, their food is not only artificial, and deficient of proximate principles attractive to the organs of smell and taste, but abounding in odorous and sapid properties repulsive to both senses. Animals, by force of habit, may have the organs of smell and taste vitiated; and this depraved habit may ultimately become stronger than the natural one; so that they may thus be trained to relish, with a gusto that almost knows no bounds, the most objectionable and unnatural food that can be given them. It would be superfluous, at the present day, to quote examples in proof of this conclusion. But, instead of this being a valid argument in favour of the artificial system now generally pursued, it is the very reverse; for the craving sensation experienced by cattle for such food arises from a diseased state of the organs of smell and taste, and also of the digestive, assimilating, and excretory functions of the body.

The depraved habits thus acquired by cattle amount to neither more nor less than a struggle—often a desperate one—as it were, on the part of Nature to adapt herself to the peculiar exigencies of the unnatural position in which she is placed. As it is in the artificial laboratory, so is it in the natural one: similar results may be obtained from different articles by different processes. But, in the two cases, the chemical apparatus is very differently circumstanced; for, in the former, old things when worn out can be replaced by new ones; but in the latter, when the organs cease to perform their functions, there is but one alternative—a new laboratory; and, as "like begets like," it is a short-sighted policy on the part of breeders to let the chemical apparatus in question get out of its full, effective, working order.

Now, as the deficiency arises from causes that cannot be obviated, but the contrary, it consequently follows that farmers should direct their inquiry to an artificial supply from natural sources; and, before they can adopt the latter alternative, they must first possess a thorough experimental knowledge of the former as to the odorous and sapid properties deficient, and this too both as to quantity and quality. And the inquiry involves something more than the supply of what is wanting; for, in the feeding materials produced by improved systems of manuring, cultivation, and cropping, there is not only a greater deficiency of the natural, but also, at the same time, an increasing supply of abnormal principles, that require to be neutralised by new processes that have to be discovered for the purpose—processes similar in character, it may be, to the heating of the haystack, and the odorous and sapid properties there produced.

Some of our richest grazings, those that produce the healthiest cattle and the finest quality of beef and mutton, may be taken as dietetic examples furnishing the normal supply of odorous and sapid properties of food. But in taking such as a natural rule for artificial guidance in cases where the normal supply is deficient, the diversity of the former dietary will be found to leave a corresponding degree of latitude for the latter. At the same time this is obviously the more advisable course for farmers to pursue in acquiring a proper knowledge of the odorous and sapid properties of the normal food of their cattle, so as to be able to solve satisfactorily the second and third problems under consideration as to the deficiency in artificial food and the resources of the vegetable kingdom from whence they are likely to get the requisite supply wanting on profitable terms.

The investigation is a chemical one, and farmers should satisfy themselves that it is so. This is the true base for successful operation, and unless adopted the upshot can hardly be otherwise than a failure. It is Nature's own plan, as exemplified in the case of the cattle themselves, for the distinguishing process which they adopt is a chemical one, as has already been shown, viz., smell. Like the blind, deaf, and dumb boy Mitchell, they eat nothing until they smell it. It is, in point of fact, a chemical process which all practical farmers have from time immemorial adopted, although they may not perhaps be sensible when smelling a thing that they are thereby solving an important chemical problem, more satisfactory, it may be, than it has ever yet been solved by any agricultural chemist in his laboratory. And as, in the latter, experience, skill, and perseverance are necessary to attain professional proficiency in analytical manipulation; so in the former, the functions of smell and taste are subject to similar cultivation. The boy Mitchell, whose case has just been quoted, affords experimental proof to the point; for if such attainments as he possessed in natural chemistry can be acquired when people are blind, it is possible to attain to a higher degree of professional proficiency when they have the additional benefit of sight, if they would only use the legitimate means at their command by exercising the functions which Nature has given them for this express purpose.

The course of action is therefore a tolerably clear one—*to cultivate the normal use of the nose.* That a much higher degree of professional skill may be attained in this branch of natural chemistry than at present exists amongst the great body of farmers must appear manifest to all who will give the subject a moment's consideration. Judging from Arthur Young's writings, he was sensibly awake to the importance of the subject, although little or no progress had been made in chemistry and physiology at the period he wrote. As compared with his time, agriculturists now enjoy many more facilities for prosecuting the work of inquiry successfully than he did, and almost the only barrier that stands in the way of such being done is the very objectional grouping system of chemistry that has been introduced since the date he penned the extract from his "Farmer's Calendar," given in a previous paper—a grouping system of analysis that takes almost no notice whatever of the odorous and sapid properties of plants, although they form the peculiar proximate principles that distinguish one plant from another, and by which plants are so distinguished by cattle.

It may no doubt be said, and indeed has often been said, by botanical writers, that the grasses and many other plants eaten by cattle have very little or no smell and taste; but the cattle themselves prove the contrary in the most decisive manner, the discriminating sensibility of their olfactory and gustatory nerves being mainly due to a higher degree of education than is exemplified in those of man when neglected, or it may be blunted, by the force of depraved habits. Our flocks and herds, for example, can, not only readily distinguish between the smells of different plants, but also between the herbage of plants grown under different kinds of manure, the plants themselves being of the same kind, and between those plants that agree with their tastes from others that are obnoxious. They are thus enabled to select their food in the dark, as during the night, often shunning poisonous plants with a degree of successful practical discrimination not very easily described, the olfactory nerves and sensorium being so situated as readily to receive impressions, and give the alarm or telegraphic message of warning when the active outspread nostril approaches a plant whose odorous properties are repulsive and at variance with the economy of the natural laboratory. The hog with its nose burrowing in the ground or dung-hill, affords a still more interesting example than the herbivora, of the activity and sensibility of both the chemical senses.

In almost every habitable quarter of the globe the grasses form the chief portion of the dietary of the horse, ox, and sheep, and no doubt they were intended by the All-wise Creator as the principal portion of their natural food. They are not, however, the only plants cattle consume, and even absolutely require, and the other vegetable productions that always accompany the grasses are very different as to species and quality in different latitudes; while the odorous and sapid properties they possess are equally diversified. Again, in seasons of scarcity, or under circumstances when the herbivora cannot get a proper supply of grass, they are induced to live for a length of time on auxiliary plants of the above kind. Thus in our country, in Orkney and Shetland, the native cattle when left to shift for themselves often live on sea-wrack, heath, and such coarse food, for weeks in succession. In tropical countries, during the dry season, when the grass is burnt up, they support themselves on fruit, such as that of the candle-tree where it grows. They also consume largely the leaves of trees and shrubs within their reach, and likewise certain gums, &c., &c.; but when the rainy season comes, and grass rises in abundance, the former are only eaten in very small quantities, purposely as it were, to correct the washy nature of the latter at the commencement of this period of over-luxuriance in such climates. The natural food of the hog, being roots, fruits, and seeds, is perhaps still more diversified, taking the world over. Thus Russell, in his "Natural History of Aleppo,"* informs his readers that there the farmers turn out their pigs to feed upon the roots of liquorice which grows abundantly in a wild state; that on such food the animals fatten rapidly, and yield pork of a delicious quality. In Palestine, again, the parable of the Prodigal Son who was sent into the fields or desert to shake the husky trees and feed swine on carob beans, an article which has recently been imported into this country from the shores of the Mediterranean for feeding stock, furnishes another example. In the olden time, in our own country and on the continent of Europe, the hog, both in a tame and in a wild state, lived on the mast of the oak, beech, &c., along with what roots, seeds, &c., it could pick up, and to this day numerous porcine herds are annually fattened on such food in the large forests of the latter. In some parts of Ireland pigs are fed on potentilla root, an article more powerfully astringent than oak bark.

It is thus interesting to follow our cattle to the fields, and examine what their chemical senses lead the different kinds to select as food, the horse choosing what the pig would shun as poison, and so on with the ox and sheep, the proverb, "One man's meat may be another's poison" (*"Quod cibus est aliis, aliis est acre venenum"*), being more applicable to our domesticated animals than to ourselves. It is no less instructive than interesting; for when cattle are so different in their smell and taste, it evidently teaches us a practical lesson how to supply them artificially with food which would be for their health and our profit to learn and carry out in their management. Let no one think for a moment that smell and taste are only passing sensations, confined to the olfactory and gustatory nerves; for there cannot be a doubt but what a perfect harmony exists between the different chemical processes of the natural laboratory, from first to last, or throughout the process of digestion, assimilation, and excretion, as formerly hinted. The contrary doctrine cannot be entertained, for it would imply an imperfect design on the part of the All-wise Creator, none of whose works furnish a shadow of grounds for such an hypothesis, the very opposite in every case being more than verified. Just as the flesh of the different kinds of sheep differ the one from the others as to smell and taste, so do their food; and this, too, is not all, for it is a well-established fact that some animals of the same race yield a very different quality of meat, as to smell and taste, from others, and this no doubt furnishes the practical reason why the shepherd's dog knows his master's sheep from those of his neighbour's flock, and even individuals of his own walk from each other.

We have in the last paragraph a threefold class of differences that command attention: *First*, the difference of smell and taste that exists amongst the different species of our domesticated animals (we shall, for the sake of brevity, confine our observations to the ox, sheep, and pig, and under this head are included the processes of making beef, mutton, and pork); *second*, the difference that exists in the articles they select for food; and, *third*, the difference that exists between the various qualities of beef, mutton, and pork, or the several articles manufactured under the different processes of the first class. In each of these three classes the diversity is so great that it may with justice be termed indefinite; for we aver that the diversity of taste and smell on the part of the ox is just as great as the quality of the normal food he relishes, and the quality of beef yielded when his carcase arrives at the shambles; and the same data are applicable to the sheep and hog, the food they consume, and meat they yield for our tables. But, indefinite as these diversities are, they are all due to differences in the quality and arrangement of certain odorous and sapid properties which we can recognise or distinguish by the organs of smell and taste, and which we have not yet succeeded by chemical analysis to isolate, so as to be able to say what their proximate principles individually are. The few exceptions to the contrary of this are entirely nominal, when compared with the vast number of odorous and sapid properties that exist in the grasses and other plants eaten by cattle.

But, although chemistry has yet much to overtake in the analytical investigation of the vegetable kingdom relative to the odorous and sapid properties of the natural food of our cattle before the above differences can be properly accounted for, yet considerable progress has been and is now being made; and, if we adopt the classification of the above properties, as previously quoted from "Henslow's Botany" and "Todd's Cyclopædia," an example or two may be taken from each as an approximate illustration of the whole. Thus, Henslow gives five classes of odours—viz., 1, aromatic; 2, fetid; 3, acrid; 4, alliaceous; and, 5, musky. And Linnæus and Boerhaave, quoted by Dr. Carpenter, in "Todd's Cyclopædia," give seven sapid properties—viz., 1, aromatic; 2, sweet; 3, acrid; 4, bitter; 5, saline; 6, astringent; and, 7, pungent—making a total of eleven classes. One aromatic is both odorous and sapid, and if twice enumerated there would then be twelve classes.

Before glancing at these several classes separately, it may not be improper to remind the reader that in the pastures they are invariably associated together; so that cattle have more difficulty in distinguishing one odour from another, or the smell of any noxious plant, whose aroma must always be less or more mixed with the odorous properties of others.

1. *Aromatic Odours.*—These consist of essential oils or certain resinous matters—sweet-scented vernal grass is a familiar example of this class. Wild thyme, lavender, marjoram, heath, clover, peas, beans, tares, and vetches in flower, furnish another series whose odorous properties are readily distinguished from each other. But these are strongly-scented plants, and, when compared with the herbage generally eaten in the pastures, may be called extreme cases. They are purposely quoted as such; but all the common grasses, as the poas, fescues, rye-grass, have each their respective smell or scent; and, if grown separately, as in the Woburn Experiments of the Duke of Bedford, any of the herbivora will very soon exemplify which it prefers, if allowed to smell them. But in them the scent is not what is usually termed aromatic, it being rather of a slightly fetid, acrid, or musky nature, much depending upon the species and quality of the grass, and the manure with which it has been grown.

2. *Fetid Odours.*—Many of the wild plants that grow in pastures and are eaten by cattle belong to this class. Thus, elecampane has a slightly aromatic and fetid odour, so has buckbean. Again, the recent leaves of scrophularia, or knobby-rooted figwort have a rank fetid odour resembling that of elder leaves, mayweed, &c. Of plants that grow in warmer climates, *ferula* (asafœtida) from Persia is the most familiar example, the odour of the gum of this shrub being both fetid and alliaceous.

3. *Acrid Odours.*—The term "acrid" is perhaps more frequently applied to sapid properties, but, like the aromatic, many plants have a sharp, biting, acrid smell—such, for example, as the acrid, odorous resin of the artemisias. Rank and rapidly-growing turnips and other plants of this kind have also a sharp, biting, acrid smell.

4. *Alliaceous Odours.*—The onion, from whence the name of this class is derived (allium), affords the most familiar example. Thus Bacon, in his Natural History, observes (cent. v., exp. 105) "Where cows feed upon wild garlic, their milk tasteth plainly of the garlic."

5. *Musky Odours.*—Of vegetable musky odours, that of the well-known musk-plant may be quoted as a familiar example; and if a handful of fresh grass is twisted and bruised so as to give forth a strong smell, it will be found not altogether free from that of an acrid, musky nature. Many plants when bruised give out a musky smell, when otherwise they are comparatively inodorous.

Of the sapid system of Boerhaave and Linnæus, the seven classes which they proposed are as follows—viz.:

1. *Aromatic Savours.*—Plants possessing an aromatic smell do not always have an aromatic taste. Most probably, however, this is owing to the sapid properties with which the odours are connected being stronger, or forming together in solution a compound somewhat different. But be this as it may, one thing is certain, that in the case of man, a proper combination of savours has long been an acknowledged reality in the art of mixing salads and also in cooking animal food. An inspired writer deemed it necessary, in the latter case, to furnish a very interesting record from the annals of the Hebrew patriarchs, in the case of Rebekah, who cooked savoury food for Isaac such as he loved, thus proving that they were well versed in the matter at that time. And to this day, the inhabitants of the East pay much more attention to this branch of domestic economy than we in this country do at the present day. It appears to have been otherwise in Evelyn's time, who, in his "Acetaria," writes: "We have said how necessary it is that in the composure of a salad every plant should come in to bear its part, without being overpowered by some herb of a stronger taste, so as to endanger the native sapor and virtue of the rest, but fall into their places like the notes in music." Or as Milton introduces Eve dressing a salad for her angelic guest, thus:

> "What choice to chuse for delicacy best;
> What order so contrived as not to mix
> Tastes not well joined, inelegant, but bring
> Taste after taste upheld by kindliest change."

But returning to cattle. Of the former description, sweet-scented vernal grass has a fragrant aromatic odour, but a bitter taste. A medical writer, Dr. Thomson, in his "London Dispensatory," says the same thing of rosemary; "Both the leaves and flowers have a grateful *aromatic* odour, and a bitterish, warm, pungent taste;" while the same authority says, "the odour of sage is fragrant, and the taste warm, bitterish, and *aromatic*." Sweet marjoram has also a warm, bitterish, and aromatic taste. Anise, chamomile, angelica, and sweet-flag possess sapid properties less or more aromatic, but associated with others possessing more powerfully savoury properties. Again, many of the barks and leaves of trees eaten by cattle have aromatic properties, such as sassafras, cascarilla, &c.

2. *Sweet Savours.*—Of sapid properties of this class little requires to be said: the examples are many and familiar. Most of the grasses possess sugar, and the greater the per-centage they yield the more are they relished by cattle. Carrots, mangolds, liquorice, and carob-beans return a still larger quantity of saccharine matter.

3. *Acrid Savours.*—Of this class the "upright meadow crowfoot" is a well-known example in pastures, its botanical name "Ranunculus acris" being derived from this property. And besides the whole of this family of plants, there are many others that have less or more of an acrid taste, such as the leaves of turnips, &c.; and, indeed, almost the whole of the brassica tribe; also tansy, another family of plante eaten by sheep.

Bitter Savours.—Sapid properties of this class are for the most part associated with tannin. It is so in the grasses, leaves, and barks, of trees that are eaten greedily by cattle. There are, however, a great many plants relished by the horse, ox, and sheep, that possess a bitter principle without any astringent property, such as the families of the astemisiæ and the gentianæ. Sweet-flag and angelica also possess a pure bitter principle without tannin, and both are eaten by cattle. Sir Humphrey Davy found no bitter extract in Holcus mollis and Holcus lanatus, two grasses that are not relished by either horses, oxen, or sheep, thus proving that the presence of bitter principle is an essential quality in their food.

Saline Savours.—This includes a great variety of substances, such as common salt, the salts of potash, lime, magnesia, sulphur, iron, &c. And in addition to these there are the vegetable acids which belong to this class. Alluding to the Woburn experiments of the Duke of Bedford, Sir H. Davy says, "*All the soluble extracts of those grasses that are most liked by cattle have either a saline or sub-acid taste.*" Rich pastures furnish an abundance of vegetable acid; and from time immemorial the practice of giving grains, beans, peas, oak and beech mast, chestnuts, cabbage, &c., to cattle, has been followed. It is, however, diametrically opposed to the obese system of fattening now generally pursued in this country, and hence it has fallen into desuetude during the past thirty years. Common salt, the salts of iron, sulphur, lime, &c., are essentially necessary to supply the blood, tissue, bones, &c., with the elementary substances of which they are composed, and when the food of cattle is deficient of the normal supply they soon lose their health.

Astringent Savours.—Sir H. Davy found in almost all the grasses relished by cattle tannin. The quantity was small in the grasses of the Woburn experiments; but many of the plants eaten and relished by cattle possess a large per-centage, such as tormentil, which yields more than oak-bark; and experiment warrants the conclusion that grasses, when grown in a natural state, with plenty of sunshine and pure air, possess more tannin than when grown artificially, under abnormal conditions diametrically opposed to the formation of odorous and sapid properties. It is also an established fact that it enters the circulation, and that our best beef and mutton owe their fine, rich, dark colour to its presence, along with iron, and that the florid and even whitish-coloured, insipid meat of water-meadows and the like are deficient in tannin, iron, common salt, &c., &c. But of this more hereafter, when we come to examine the medicinal properties of such substances, and the peculiar function they perform in the dietary of our cattle.

Pungent Savours.—Many of the plants already noticed have been stated to possess a pungent taste, such as artemisia, carraway, common marjoram, thyme, juniper, rosemary, &c., &c.

Such is a very general review of the twelve classes of odorous and sapid properties enumerated by Henslow, Linnæus, and Boerhaave; and in each class chemistry has already made considerable progress in isolating the proximate principles upon which their odours, savours, and medicinal action depend.

W. B.

THE AGRICULTURAL LABOURER.

Canon Girdlestone delivered a lecture on "Locomotion" at Tiverton, on March 14th, in the course of which he affirmed that he could readily say that working-men all his life long had been near and dear to him. In Lancashire, where for thirty years he had a parish of 25,000 souls, mechanics, colliers, and weavers; in Bristol, shopmen, sailors, mechanics, and porters; in Gloucestershire, agricultural labourers who were well housed, well paid, and well cared for; in Devonshire, and especially in the parish of Halberton, he found the agricultural labourers badly paid, badly housed, and badly cared for; and they were the persons in whom he had been chiefly interested. He had always been used to working-men, and therefore when he found himself in a room like that, he did not feel like a fish out of water, but a fish in his own element. The Canon gave an account of the difficulties attendant on locomotion from the year 1553 to 1800, and dwelt at some length on the change in locomotion which set in about the beginning of the present century. Coming to the effect produced by this change on the wages of the labouring classes, by enabling them to emigrate to other parts of England and the colonies, the Canon said: "In this part of my subject I am myself deeply and personally interested, and therefore, with your permission, I will dwell upon it for a few minutes. When I first came to Halberton, I found that the wages of an able-bodied, industrious married labourer were only 8s. and in some cases but 7s. a week, out of which, with a few exceptions, house rent, fuel, food and clothing, and medical attendance, for self, wife, and children—in short, everything—had to be paid. There never was a more difficult problem set before a man than to endeavour to make both ends meet under such circumstances, and it appeared to me a most improper state of things. I did my best in all possible ways to persuade the farmers of this. I told them that, setting aside all moral obligations, even in a pecuniary point of view they would be gainers by paying their labourers better; that if they took out of one pocket a few shillings a week more for wages, they would put into the other pocket much more, saved out of a decreased poor-rate, and the more efficient work of men better fed, and with fewer temptations to dishonesty. The only answer I got was, that I was a fool for my pains; that I ought to know that wages, like water, always find their own level, and that the labourers, if they could better themselves, would be sure to do so. 'Well,' said I, 'water will find its own level if you give it a vent. But labourers are not in the condition of water as long as they are pent up in the place of their birth, by not knowing in what part of the country better wages are given, and not having the means of removing to a distance.' So I set myself to work to make a vent for the water—to teach the labourer where he might get a fair day's wages for a fair day's work, and furnish him with the means of removal. By my instrumentality no less than thirty-eight labourers from this neighbourhood—about half of whom are married with families, and half single men—have been removed to various places—Ireland, Lancashire, Yorkshire, Essex, Kent, &c.; where the married men all get house and garden rent-free, with sometimes fuel added, with wages varying from 12s. a week the lowest, to £1 a week; and the single men mostly board, lodgings, washing and mending, and 6s. a week. This is still going on; I have still applications both from and for labourers; and now that the vent is made, the farmer's dictum, which they thought I was too ignorant to know about, and too wanting in power to make practical, is fulfilled. Wages are finding their own level. As some of the water keeps flowing out to a higher level through the opening which I have made, that which remains keeps rising. The wages of the agricultural labourer are rising, and must continue to rise in Halberton and the neighbourhood. Now that his eyes are opened to the fact that he can get well paid in other parts of the country, the Devonshire labourer will be a great fool for his pains if he does not combine, unite, struggle, and persevere till he gets his cottage rent-free, and his 12s. a week for wages. As for the merciless pelting which these efforts of mine in behalf of the agricultural labourers have brought upon myself from the farmers and the papers which espoused their cause, I have all along said that my skin, by many years' exposure to public criticism, has become as tough as that of a rhinoceros." The Canon added that whether the farmers or the papers aimed a blow at him, it only rebounded against them with double force; and that in spite of the farmers and the papers, there he was all alive and kicking, and as merry as ever. "The little pellets aimed at me by those who are chiefly interested in keeping wages down have done me no harm, and have only recoiled in ridicule upon those who aimed them. Meanwhile, public opinion has been wholly with me, and sympathy and assistance to my cause have poured in upon me from all quarters and from all ranks; and, with the exception of a very few, who are too ignorant and too prejudiced to be even less than 50 years behind the rest of the world, those who in the first moment of excitement were, against their better feelings and judgment, induced to join in the personal abuse and spiteful opposition with which I have been met, are ashamed of and sorry for their conduct, and are beginning to see what men in other parts of England have long since known, that every master is not only under a religious and moral obligation to treat his labourers kindly, and give them a fair day's wages for a fair day's work, but has also a direct pecuniary interest in doing so."

VITALITY OF SEEDS.—In a paper recently addressed to the Academy of Sciences, M. Pouchet, the celebrated physiologist of Rouen, gives an account of some experiments of his on the vitality of the seeds of the Medicago Americana, a sort of clover. A vast quantity of wool is received at Elbœuf, from Brazil; but it is in a very dirty state, and contains, amongst other impurities, the seeds of various plants. M. Pouchet was told by several credible witnesses that the seeds mixed up with this wool would strike root and grow up into plants even after undergoing a four hours' ebullition during the various operations of dyeing. This was a startling assertion, it being admitted on all hands by physiologists, from Spallansani downwards, that the vitality of seeds is utterly destroyed in boiling water. M. Pouchet resolved to verify the truth of this alleged fact, and accordingly boiled some of these seeds for exactly four hours without any interruption. After this operation the seeds of the Medicago were found to be enormously swollen; the water had become mucilaginous, and it was with no great faith in the success of his experiment that our author put these disorganised seeds into flower-pots containing earth utterly free from any seeds of the same kind. Nevertheless, in the course of from ten to twenty days, several plants sprang up; and this experiment was repeated more than twenty times with equal success. After minutely examining all the circumstances, M. Pouchet at length found that among a large number of seeds in a state of utter disorganisation, there were yet a few that had successfully resisted the action of boiling water. They had, indeed, borne the temperature of 100 deg. Centigr. for the space of four hours, but their outer tegument had proved watertight by some unexplained circumstance. Our author immediately concluded that such must also be the case with other seeds, and he accordingly tried with wheat, barley, millet, &c., but without success; for the present the seeds of the Medicago are the only instance of this wonderful vitality.—*Galignani.*

MILLS AND MILLING.

21.—DRESSING AND CLEANING OF GRAIN FOR GRINDING BY DRY PROCESSES.

However careful a farmer may be in dressing his grain for market, it is seldom fit for grinding until it has gone through some preparatory cleaning process or other. Some kinds of corn, as the oat, require to be kiln-dried, in order that they may be shealed and ground. Not a few practical men begin to think that wheat when it contains an excess of moisture, as it very frequently does, ought to undergo some process of drying, as by heated air, in the harvesting or granary, so as to bring it to the proper degree of dryness. And about the *modus operandi* of drying wheat we aver opinion amongst farmers and millers is very much divided at the present time, some saying that it should be decorticated, and then dried; others that slow drying in the sheaf or granary by heated air, according to some modern propositions and patent processes now in extensive and successful operation in this country and the continent of Europe, would not interfere with its decortication and grinding afterwards, as the slow cooling of the grain in the sheaf or in the granary would restore the whole to a uniform degree of moistness throughout, thereby obviating the adhesion of the bran to the kernel, the process of drying being thus similar to what takes place when it is dried in the field before stacking, or in the stack before thrashing. Nay, more than this; for it has been affirmed that Art can easily beat Nature in the drying of grain, were once an apprenticeship served at the process. Then there are smut machines, screening machines, scouring machines, and cleaning machines of endless variety in daily operation; while the fruitful genius of Invention bids fair to give the lie to the oft-told saying of Solomon that "there is nothing new under the sun."

There cannot be a doubt that the proper preparation of the grain for grinding is a branch of the art of milling second to none in its importance, more especially in a country like England, where so much foreign corn is annually imported for grinding. No doubt the practical question is of equal if not of greater magnitude to the millers of the United States of America and other countries who send us flour; and that microscopic discovery and chemical progression are greatly enhancing the value of the practical problem in both cases in the estimation of the public, as compared with the past, when the unaided eye was blind as to the cause of the heavy losses sustained, from the presence of animal and vegetable life that lay hold on the wheat and flour as a means of subsistence, to say nothing of chemical questions. Another reason, and by no means an unimportant one, is the improvement which has taken place in machinery of the kind in question, and in its manufacture.

When farmers thrashed and ground their own corn at home in a quern, the sieve was the only instrument in use for the cleaning of wheat for grinding; a coarse one, or riddle, being used for removing cut straws and the like, by allowing the wheat to pass through the holes or open meshes, and a fine one for the removal of sand and the like. In short, sieves of different degrees of fineness were used in the cleaning of all sorts of grain for grinding. In the sacred writings, frequent allusion is made to sieves and the process of sifting; and from the cradle of the human race the practice has migrated northwards and westwards over Europe to our own Ultima Thule, as found in operation by Pennant so late as the middle of the last century.

The process of sifting wheat and other grain in a sieve has a twofold action in cleaning, viz. (1), the rubbing of the grains of wheat against each other, thereby polishing them as it were by friction and attrition; and (2) the removal of all refuse matter thus rubbed off the grains, or which was otherwise present in the sample. And perhaps the former of these two processes has been too little attended to as to its effective character; but be this latter hypothesis as it may, it is a well-known fact that parched corn, though "black as coal," as stated by Pennant, was wholly deprived of the charred dust and blackness by the active continuous process of sifting in a sieve. And all who have any experience in a granary must be familiar with the cleaning and brightening of the sample by putting it through a blower or fanners having a series of riddles and screens corresponding in fineness to the quality of the grain. In this case it is a sad mistake to suppose that the cleaning of the grain depends solely upon the subjecting of it to a strong blast of wind, for the purpose of blowing out the dust, mites, &c.; for there are thousands of unseen little bodies besides mites, that cling more tenaciously to their daily bread than is imagined in such a conclusion.

In the shealing mill already referred to in the "Farmers' Dictionary," fifth edition, 2 vols. quarto, published 1807, the process of cleaning is described at some length, with illustrations. From the granary or hopper into which the corn is put it passes over a coarse wire harp or scance, to a wire sieve actuated by a crank-movement. These are for the removal of small seeds, sand, and the like. From the sieve the wheat falls into a spout, which conveys it to the eye of the shealing-stones, or millstones set sufficiently close to rub off any foreign matter that adheres to the grain, but not so close as to grind—a process which in old works is termed shealing or hulling. From the millstones the wheat passes over another wire sieve to the fanners, from which it is sacked, and elevated by tackle to the garners ready for grinding.

Such is a brief account of the process of cleaning wheat for grinding commonly practised about the commencement of the present century; but, like all other practices, there was a very great diversity in the *modus operandi* of carrying it into effect, more especially as to the shealing and fanning processes, some millers setting the stones sufficiently close to decorticate the wheat, especially where the sample was fine, plump, and equal. To a certain extent this, no doubt, reduced the quantity of flour, as much of the wheat-dust or downy matter covering the kernel was removed, along with the coarser portion of the bran; but it considerably improved the quality, which, to some private families of distinction, who ground their own wheat at their own mills, or at grist-mills to which they were bound, was of no secondary value. At that time, it must be borne in mind, farmers had not the means of dressing their grain which they now have; so that, in the processes of screening, sifting, and fanning, not only seeds, but much coarse, inferior wheat and empty husks, or tail-corn, were also separated from the sample. The propriety, in a professional sense, and even necessity in not a few cases, of thus subjecting the grain to these several cleansing processes, will appear manifest, especially to those whose experience carries them back retrospectively over half a century; for to allow the grain as it came from the barn of the farmer to get between the millstones when set for grinding would have inflicted a serious loss upon all parties interested, whether the miller was manufacturing his own purchases on his own account, or grinding to others, either for money or molture, and not a liltle of this applies to the present day.

The principles of wheat-dressing involved in the practice of the above old shealing mill very closely resembles those of the present day. Indeed there are not a few old mills of the last century still going, with very little modern novelty added. There is, however, a very great differenee in the construction of the dressing machinery now in use and in the expedition with which their work is performed. The grain, as it comes from the barn of the farmer, is also dressed in a much superior manner, as compared with the upshot of the old processes of the last century; while the future is promising a still higher degree in the perfection of mechanical details, so as to produce finer and purer samples of wheat and flour.

Wire screen cylinders, armed with all sorts of brushing rubbing, and belabouring devices upon the spindle, and upon the interior surface of the cylinder, have long been in use.

Such corn-screens are also becoming common in the barn and granary of the farmer and corn-merchant, who both find their use to be advantageous, as millers invariably give, proportionally, a more reduced price for samples that require much dressing than for better-dressed qualities, there being a marginal difference in favour of the farmer and corn-merchant, as profit, which margin does much more than cover the outlay of capital invested in such machines. Into these cylinders, rotating at various angles, the grain enters at one end, and, when properly dressed, is discharged at the other, the seed passing through between the wires, while provision is made for separating small stones and the like. In the construction of these machines much ingenuity has been shown by devices for regulating the distance between the wires, so as to adapt them to the screening and dressing of different kinds of grain. And, to add to the effective working of such devices, a continuous blast of air has been blown in along with the grain, for the purpose of blowing the dust and light refuse rubbed off the grain out, through the surrounding wire screen, or perforated cylinder, so as the better to brighten and purify the sample.

Another plan is to make a vertical cone or cylinder revolve within another hollow fixed cone or cylinder, the outer and inner surfaces of these cones and cylinders being armed with various mechanical devices for cleaning the grain. It would take a long chapter to give the most general outline of the numerous patented and unpatented contrivances of this kind which have been proposed and partially carried out into operation within the first half of the present century; but such is unnecessary, as those that have been used are for the most part familiar to our readers.

The more recent movement in the line of progress is in favour of improving upon the old plan of heated-air drying and decortication — *i. e.*, improved decorticated mills, or shealing mills; and this too, it must be borne in mind, are in addition to the above rotary screening and scouring contrivances; these latter being necessary to prepare the wheat for the former—the decorticating mills—which have already been disposed of in a former paper. We refer to them just now purposely to prevent any of our readers running off at a siding, under the belief that decorticating mills are intended to do away with screening and scouring machines, the reverse of this fallacious conclusion being the order of the day.

The amount of machinery thus involved for dressing grain for grinding is not much greater at the present day than what was in use under the old shealing mills of the last century, with their sieves and screens, and fanners, of which descriptions will be found in most agricultural writings, works on mills, &c., of that period. We also aver that the past was, if anything, more expensive than the present, making the proper allowance for the difference in the value of money itself which has taken place, while the effective power of modern machines is certainly greatly in favour of those who use them, as compared with the clattering noisy apparatus of the olden time. The practical conclusion, therefore, is in favour of the march of improvement, no less to the farmer and the corn merchant, than to the miller and his customers—the general public.

In the grain-dressing machines, under notice, although much has been done to improve them of late years, so as to simplify and increase their effective working, we must caution the reader from arriving at the hasty and erroneous conclusion that nothing more can be done in this direction, the contrary being true. In point of fact, farther improvement is much needed just now, and in the patent office there is no little stir about it. There are, however, only a small per-centage of patented projects that even see the daylight of successful practice, and it would make not a few millers smile were we to quote the innocent discoveries now being patented, provisionally or otherwise, in this peculiar branch of mill machinery!—things, too, that have been patented many times before? Moreover, this is not all, for more than mere novelty in special mechanism and combination requires to be attended to at the present time, owing to the greater amount of chemical knowledge now being brought to bear upon the subject of milling, and the influence which this has upon public taste, together with the true value and economy of offal matter, such as bran, &c. In other words, practical men begin to see that the mechanical construction of dressing machines must accord with the chemical demands of the quality of the grain and flour.

The two principal chemical questions involved are as follows: *First*, the preservation of the natural odorous and sapid properties of the flour, the practical maxim being this—that if these are preserved the general nutritive properties will also be preserved; and *second*, the utilization of offal in the manufacture of feeding stuffs for cattle—and we may add that these two questions embrace the professional duties and interest of the farmer as well as those of the miller. In the form of interrogatories they may be thus stated: To what extent can the artificial drying of grain in the sheaf, and in the granary, and the decortication of grain before grinding, be carried? What economy in the use of bran and other offal can be effected by their being mixed with other materials in the manufacture of feeding stuffs for cattle? And how will such affect dressing machines? To the former of these questions we shall return under the next sub-heading.

22.—WASHING AND DRYING GRAIN.

23.—MOISTENING GRAIN.

These two sub-headings may be discussed together. The former, besides washing, includes not only the processes of kilndrying and parching corn, but also those of drying in the sheaf and in the granary by heated air, the baking or torrefaction of corn and flour in ovens, and the drying of grain by centrifugal action. The latter includes the various chemical processes now proposed to promote the decortication of grain; but we shall notice them only so far as they are public property, our intention in this series of papers on Mills and Milling being to avoid as much as possible all notice of unexpired patents.

The washing of grain so as to remove impurities, and the drying of it immediately by various processes, have long been a favourite speculation among theorists, although the reverse among practical men. But, as the days of impossibilities are gone by, it would consequently be unwise, if not contrary to rule, to throw obstacles in the way of those now experimenting in the washing and drying of grain on a limited scale, by raising an opposite hypothesis; for practical men can well afford to leave the question at issue an open one, for the successful experimental solution of the future. In the United States of America there are innumerable plans, some of them patented long ago, others, the propositions of farmers, corn-merchants, and millers, without patent, for fumigating granaries in various ways before grain is put into them. This is done for the purpose of destroying vermin—insects, fungi, &c.; and in this country farmers have long been in the practice of washing their seed-wheat and other kinds of grain to prevent smut, and also of fumigating to improve appearances. If we, therefore, put in the scales the philosophy of the facts of the case involved in these several processes, it will be found that the pioneers of progress who advocate the washing of grain have no little solid ground to stand upon; for harmless solutions, tinctures, or vegetable infusions—say, for the sake of argument, salt water, or volatile oil, &c.—may be discovered, which will preserve grain in granaries, or meal and flour in bins, sacks, and barrels, so as to obviate or lessen the heavy losses now sustained in the corn and flour trades.

Another *rationale* is to wash and decorticate before drying. Under the old practice, long followed in this country, of decorticating moistened barley with a pestle-mallet in a mortar, the work of decortication was not prosecuted faster than the pot-barley thus made was required for use, so that there was no need of kilndrying under such circumstances, as the barley was taken out of the mortar, washed, and put in the pot. It was only when the pot-barley thus made had to be sent to a distant market that kilndrying or drying in the sun became necessary; and in this practice there was very little business done, as people in towns had their own mortars and pestles for making what pot-barley they themselves required.

It would be unwise, however, to propose yoking the Future in the harness of the Past. In all branches of art, milling not excepted, the subdivision and abridgment of labour by machinery and chemical processes have become the modern rule; so that, if any company or enterprising individual can send to market the various kinds of grain in a decorticated state, as wheat, barley, oats, peas, &c., manufactured either by improvements on the old processes or by new ones not yet discovered, and if such products of manufacture are found superior to present stuffs for the various uses for which they are required, such manufactories may in the meantime be allowed a hearing, as they will eventually speak for themselves.

There is another question in connexion with this peculiar view of our subject now under notice that must not be passed over in silence altogether, viz., Ought all samples of wheat to be ground as they now generally are by millers—after a common rule—as to drying? or do puddings and pastry of endless variety require something very different from that used in the baking of bread? and confectionary flour something wholly different from either? All three having each its own peculiar demands, first upon the mode of drying, or it may be baking the wheat before grinding? and, second, upon the process of grinding itself? We can readily anticipate a whole host of millers briefly answering "Nonsense!" to one and all of these interrogatories; but the go-a-head spirit of the times is compelling old-fashioned, people in every branch of art to think anew; and the experience of the future may also teach millers that they are no exception to the common run in this respect; for it may be laid down as a rule to all trades—*that differences on one side require corresponding differences on the other;* so that the old plan of setting the millstones a little further apart or nearer to each other, as the case may be, and nothing more, is already out of date. In short, millers must go full swing into the chemistry of their profession; and the sooner this is done, all the better for themselves and their customers.

Apart altogether from these modern new-fangled chemical questions of separating the stive, properly so called, or the downy substance that covers the kernel, technically ycleped "wheat-dust," "barley-dust," "oat-dust," from the kernel itself, and of changing the nature of the constituent elements of the kernel by the process of heat, or other chemical agency, our fickle climate is annually rendering the solution of the question of drying corn in the sheaf and in the granary more and more imperative. Farmers begin to find that it cannot be much longer shuffled off and off, from bad harvest to good and from good to bad, for something practical must be done; and the same conclusion is forcing itself upon the attention of corn-merchants and millers. In point of fact, the latter two are now drying grain by heated air in granaries—with the marked promise of the extension of the practice in every corner of the kingdom.

Drying grain by heated air is an old practice. The ancient Romans, Germans, and northern races were familiar with it, and our own Celtic and Saxon ancestors were by no means strangers to the drying of their corn in the straw by fire. No doubt the practice amongst the Etrurians, Germans, and inhabitants of the North of Europe was very different in its details from that now proposed and being carried into effect under patented processes; still the principle of kiln-drying grain, and of drying grain in barns or apartments by means of heated flues, or by blowing in heated air, as in one of the patents quoted in a previous paper, was that of heated air. Fire stoves and chimneys are comparatively of modern discovery. When this country was under the Romans, the fire was either in the middle of the floor, or else the building was heated by means of flues, under the flooring, as on the principle we heat greenhouses, and the like. On both these plans large quantities of corn in the straw has been dried and rendered fit for thrashing or stacking in the barn in this country and in the north of Scotland at no very distant date; and in Russia, Sweden, and Denmark the practice is still in use. We may refer our readers to Loudon's "Encyclopædia of Agriculture" for an account of the practice in question, the letter-press description being accompanied with drawings of the barns for the drying of the sheaves in bad harvests. Indeed, few harvests are concluded without their being called into operation to further the ingathering. See also the *Gentleman's Magazine*, in which the propositions of Duhamel and Dr. Hale, for drying grain in granaries, will be found discussed at length about the middle of last century.

The practice described by the late Mr. Loudon in his "Encyclopædia of Agriculture" is, however, not suited for the present wants of the English farmer, much less are the kilns which we ourselves have seen in the north of Scotland, said to be occasionally used (then 1826-1840) in the drying of sheaves in very bad harvests, and which would not have dried more than twelve small sheaves at a time, the drying being performed by a slow peat-fire in the "kiln-eye," so as to obviate sparks. One of them which we saw in Ross-shire in 1839 was considered a modern improvement, there being iron bars upon which the sheaves were laid and ventilators above, its predecessor having only bars of wood. When thrashed corn or malt was to be dried, about four or five inches depth of straw was placed over the bars, and pressed down close, to prevent the grain falling through. The fire was kindled below, as in the common kilns for drying oats in the north; the current of heated air that fed the fire in the "kiln-eye" being drawn into the apartment below the bars, and up through the straw and grain, carrying as usual a volume of steam along with it out at the ventilators above.

To understand this part of our subject practically we must take our readers back to a period in the history of the North, when farmers were their own millers, bakers, brewers, and distillers. There was not much arable husbandry in the far north then; but the little corn harvest that was reaped was all the more valuable on that account. When the Romans first landed on the southern shores of Britain, they found large breadths of growing corn and querns in daily operation grinding meal. To the Roman soldiers, who were accustomed to parching corn at home, the practice of setting fire to the corn in the straw, then the common one in old England, was not so rude and barbarous as it may appear to some at the present day; but in very wet harvests the straw would not burn freely, and in the far north drying was often necessary to make the straw burn in ordinary seasons. Again, barley and other grain intended for malting and seed were not parched, but dried either in the sun or upon the kiln. The former barley and other grain for brewing and distilling was "lashed out," as we have seen it done in some parts of Ireland not many years hence, handful after handful, over a stick-board or barrel, the corn being thrown into the steep often before it was fit for stacking or housing in barns in the sheaf; but when made into malt it required drying in order to store it for the demands of the family, hence the erection of kilns by farmers as the people became settled in fixed localities and betook themselves to the peaceful pursuit of husbandry.

Some of the Celtic kilns which we ourselves have seen were very rude structures, but they often made better work than those erected at greater cost upon a larger scale, such as those in use. This was owing to their superior ventilation, the fire in the eye of the kiln producing a continuous influent current of air, and consequently a continuous current of heated air up through the sheaves, grain, or malt, (as the case may be) upon the straw over the rough, charred bars of wood. When dried in the sheaf, that which was intended for seed was stacked, either indoors or out, and that for meal generally parched immediately, as the parched corn was much more easily stored, while, thus stored, it was always ready for daily grinding in the quern. When farmers were compelled to grind at the Laird's grist mill, and to break in pieces their own querns, these small farm kilns were in many instances kept up for the purpose of drying the corn in the straw in wet harvests; but we aver that some of those which we saw were in reality preserved for the drying of malt used in illicit distillation. But be this latter hypotheses as it may, kilns for drying malt were often made under ground, the malt being dried by heated air passing through it, the effluent current of heated air and steam escaping into the atmosphere, at a distance from the kiln and distilling apparatus, by means of a flue or drain, one fire being made to serve all the purposes of the illicit concern. We merely refer to these underground systems because of the principles of drying by heated air which they involve.

In southern latitudes corn is, and always has been, dried in the sun, so as to fit it for the barn, granary, or for grinding; but to this common rule there are many exceptions, corn in the ear being dried in kilns, ovens, &c. The ancient Romans, who drew their supplies from all latitudes, were familiar with these several practices. Even at home, the Etrurians, not only used kilns before parching spelt in the husk and in the ear, but large buildings heated by means of flues in the walls or under the floor, so as to supply the demands of the market in wet seasons, when the supplies of the corn fell short of the immediate consumption. And besides this, corn was purposely cut green, and the soft green ears dried by roasting them on kilns, or in ovens, in order to produce certain favourite kinds of parched corn and meat for use—a practice which was also common amongst the ancient Chaldeans, Hebrews, &c.

To improve upon these old practices, so as to adapt them to present use, has long been a favourite theory amongst the pioneers of progress; and, in tracing the march of progressive improvement through the dark ages of the past, it is no easy matter keeping them all clearly in view so as not to lose sight of any of them. Difficult, however, as the task may be, it must be done, in order to do justice to those more immediately interested in the cause of progress in the art of harvesting grain, so as to adapt it for the demands of the current period, when all the world is at rivalry in the English market. The subject, too, is one that has often been discussed in these columns; and, although numerous practical plans have been proposed, it is nevertheless far from being exhausted. But into these modern propositions we cannot go further at present.

These old plans involve four separate principles of action —the first, heated air, as in the common kiln; the second, hot air, as in an oven, or before a fire; the third, air heated in passing through pipes or flues, or over a heated surface; and fourth, centrifugal action, as in drying clothes, &c. Into the working details of these several plans, our limits will not permit me to go further at this time. Although kilns for drying grain are constructed much according to a common design, yet, when closely examined, the mechanical differences are greater and more numerous than generally imagined. The fact that some kilns work well, others badly, while between these two extremes numerous examples may be found, proves the soundness of the general conclusion. Drying in an oven, or heated apartment, before the fire, or in the sun, are practices that may all be disposed of in one sentence; and the principles of the other two plans—blowing hot air through pipes, and drying by centrifugal action—are now public property; so that all that the pioneers of progress can claim are the innumerable mechanical modifications in carrying them out into practice—a wide, wide field to enter upon and occupy.

The proper drying of grain, whether for stackyard, granary, or grinding, involves chemical questions as well as mechanical ones; and, of the two, the former require at the present time perhaps more attention than the latter. When wheat is improperly dried, either in the sun in hot climates, or in kilns in northern latitudes, it requires to be moistened before the bran can be removed in the grinding. The very reverse of this takes place in the kiln-drying of the oat, the drying facilitating the operation of shealing. Much of this difference is, no doubt, due to mechanical data; but there is, nevertheless, a chemical view that demands a closer investigation than it has yet received, in order to account satisfactorily for all the changes experienced, so as to obviate the adhesion of the bran to the kernel, and, by consequence, the moistening process, either by the watering pan, passing the grain over a wet traveller band, or by steam, as all these moistening processes are obviously at variance with the true line of progress.

24.—DRESSING AND COOLING FLOUR.

The mode of dressing flour practised by the ancient Chaldeans, Hebrew, and other nations of the East was simple, and therefore in keeping with the mill itself, or, more practically speaking, it was simply what it is at the present day—not only amongst Eastern nations, but amongst ourselves—*i. e.*, sifting in a hand-sieve. The ancients, however, were also acquainted with the bolting cloth—*i. e.*, the finer portion of the flour they removed from the bran and coarse portion by shaking it through a cloth. The undressed flour as it came from the mill was either put into a bag, or tied up in the mill-cloth (*i. e.*, the cloth upon which the millstones were placed), and then by shaking it in a vessel, or against the sides of the tub or flour-bin, the finer flour was thus removed. The coarser that remained in the bag or millcloth was then sifted, to remove the bran, and, if need be, put through the mill a second time before this latter process of putting it through the sieve was effected. Both these old modes of dressing flour have come down to our own times, having, no doubt, been brought with the Celtic tribes from the plains of Shinan at the dispersion of the human race on the confusion of tongues at Babel.

Of the construction of the ancient Hebrew and Chaldean sieve, history, sacred and profane, furnishes very little that can be relied upon as to detail; but the probability is, that it closely resembled those in use at the present day in the East, and even in many parts of this country—*i. e.*, some sort of cloth, or woven texture, or skin stretched over a hoop, the latter being pierced with holes—*i. e.*, hair sieves, linen sieves, sheepskin sieves, &c.; and that these were of different degrees of fineness is also manifest. The sacred historian records that Sarah made cakes of "fine meal" for the angels that visited Abraham (Gen. xviii. 6), indirectly proving that at that early date there was a coarser quality of meal, and hence coarser and finer sieves for sifting; or else the fine meal was separated from the coarser by bolting bags or cloths—the latter being the more likely conclusion. But be this as it may, the Hebrews had flour of parched corn, and also of unparched corn, of various degrees of fineness, by grinding and sifting, thus involving sieves of corresponding degrees of fineness. Again, the different grains and seeds cultivated and used by the Hebrews are so many practical proofs to the same effect. Hence the fallacious conclusions, if not absurdity, of those writers who trace the inventions of sieves and everything else to the middle or dark ages of the Christian era.

Beckman, in his "History of Inventions," quoting Bohn's edition, vol. i. p. 161, says: "It is highly probable that in the early ages men were satisfied with only grinding their corn, and that in the course of time they fell upon the invention of separating the meal from the pollard or bran. This was at first done by a sieve moved by the hands; and even yet, in France, when what is called *mouture en grosse* is employed, there is a particular place for bolting, when the sieve is moved with the hands by means of a handle. It is customary also in many parts of Lower Saxony and Alsace to bolt the flour separately, for which purpose various sieves are necessary. The Romans had two principal kinds, *cibra excussoria* and *pollinaria*—the latter of which gave the finest flour, called *pollen*. Sieves of horse-hair were first made by the Gauls, and those of linen by the Spaniards. The method of applying a sieve in the form of an extended bag to the works of the mill, that the meal might fall into it as it came from the stones, and of causing it to be turned and shaken by the machinery, was first made known in the beginning of the sixteenth century, as we are expressly told in several ancient chronicles."

A little farther on in his "History of Inventions" the same authority qualifies very much the above account when he informs his readers that the Romans in Pliny's own time had more kinds of flour than either the French or Germans, and hence had a greater variety of sieves and modes of grinding and dressing, enumerating the following kinds, on the authority of Pliny, viz., "*similago, simila, flos, pollen, cibarium*, &c."

The long string of names thus quoted, which was used by the Romans to distinguish their different kinds of flour from each other, does not, however, convey to the reader their practical meaning in plain English. In Pliny's "Natural History" there is much that is contradictory. Of this the greater part is, perhaps, more apparent than real, much being always left by him as understood or taken for granted, as known to his readers; so that, to understand Pliny, one must first make himself acquainted with the details of practice as understood by his Roman readers at the time he wrote; but in the majority of cases one part of his "Natural History" explains another. Thus Pliny himself tells his readers (quoting the substance of our remarks from Bohn's Library translation, vol. iv., page 34): "The fine flour of African wheat is called *pollen*, and the fine flour of Italian winter wheat *flos*;" while in another page of the came volume *cibarium* is synonymous with *secondariæ* or *seconds*, as in the translation. We must observe, however, that other Roman authorities, such as M. Terentius Varro, use the term *pollen* synonymously with the English word *stive* or *dust*, that pervades the mill—*i. e.*, that which adheres to the miller's coat, giving him the name of "dusty miller;" or, in a more limited sense, the fine, downy, light substance that surrounds the kernel, to which some of the finest of the flour always adheres, unless it is removed before the grain is ground, by decortication or otherwise. Generally speaking, therefore, the Romans in Pliny's time had fine flour, seconds, and bran, from different kinds of wheat, so that their method of dressing very closely resembled that of our own. Instead of using a substantive name for the different qualities of flour produced by the wheats of different places, we use the names of those places adjectively. Thus, instead of pollen for the fine flour of African wheat, we would say Egyptian fine flour, American flour, &c. The Roman millers were also familiar with the practice of increasing the whiteness of the colour of the flour by fineness of grinding and sifting or bolting, and they also used much of the flour manufactured, as we do, for brown bread. There were, however, several peculiarities, more especially in the old Etrurian methods of milling, which involved corresponding differences in the qualities of the flour and modes of dressing. Thus the flour of parched corn was different from that of unparched. For a long period spelt, millet, and panic were invariably parched. The reason which Pliny assigns for this was, that these grains could not be otherwise shealed and cleaned for grinding. In this, however, Pliny is at fault; for long before Pliny's time the Etrurians and Romans too had discovered methods of decorticating spelt and other grain, as Pliny himself acknowledges in a different chapter, where he says that some authorities consider the moistening of these and other grains in a mortar, and then working off the hulls by a pestle, as the best plan of decortication; and this, again, gives a different and whiter quality of flour, if the dust or stive is properly removed in the process of decortication, and if the grain is properly dried in the sun afterwards. Again, parched corn was shealed in a mortar, sometimes in a dry state and in others in a moist state, so as to produce different qualities of flour; while flours somewhat analogous to our potato flour, tapioca, &c., were obtained both from ripe corn and green, all of which gave rise to corresponding modes of dressing and preparing them for market and use. In short, any one who can read Pliny and the other old Roman authors referred to above, and understand them from a practical point of view, will readily perceive that the Romans had what may not inaptly be termed an extravagant variety of flours, with a corresponding variety of modes of dressing, into all the details of which we cannot now go; but enough is recorded in the works of the above authorities to curb the rather exuberant pretensions of some of our modern inventors, on the one hand, and to stimulate millers, on the other, in the march of improvement in this branch of milling.

From Britain being one of the chief seats of Druidism, and from the intercourse continually kept up between the Celtic tribes in Western Europe and Asia and their British colonies, and between the Saxon races of the Continent and those of England, it is easily accounting for the introduction of the quern, and modes of grinding corn and dressing meal found in operation by the Romans when they landed in England. That the British colonies were behind the mother-countries in agriculture and the other useful arts is natural, for we find the same state of things existing between Britain and her colonies at the present day; but then, as now, the colony cannot be considered ignorant of the position of the mother-country in the arts of milling. The Celtic tribes of Asia, in the days of the Apostle Paul, had evidently attained to an exemplary state of industry and civilization; so had those of Europe, as also the Saxon races on the Continent. We cannot, therefore, adopt the too-common line of arguing from a more barbarous to a higher state of the arts by the exclusive theory of invention; for until the colony advances a step ahead of the mother-country the probability is that the former procures her improvements in the arts from the latter—in other words, that our Celtic and Saxon ancestors brought their mills and sieves with them from their respective mother-countries, and that the Gauls and Spaniards referred to by Pliny did the same, either bringing their hair sieves and linen sieves with them, and also their sheepskin sieves, from the countries from which they emigrated, or else procuring them afterwards with the imports of subsequent immigrants.

That the Romans introduced into this country, and other countries similarly inhabited, many improvements in milling is manifest, as a healthy state of the arts invariably sprang up where peaceful and industrial habits were established by them; but at the time they governed Britain many of the Celtic and Saxon races of the Continent were as far, if not farther, advanced in the art of milling, than the Romans themselves—the Etrurians, perhaps, excepted. If in the days of Pliny the Romans got their millstones from Germany, their hair sieves from France, and their linen sieves from Spain, the probability is that England got her improved millstones and sieves from Germany, France, and Spain also; and if Spain first got her linen sieves from the African and Asiatic shores of the Mediterranean, the probability is that the Phœnicians—who were a commercial and manufacturing people, and who also traded with the inhabitants of Britain—gave, in exchange for tin, labour, and raw produce, not only the small linen sieves then used in sifting the meal as it was daily ground in the family mill, but also the hair sieves and the sheepskin sieves, long before the Roman conquest—sieves which have come down to our own times—sieves too very similar to those used by Melchisedek, King of Salem (Gen. xiv. 18), and the patriarch Abraham (Gen. xviii. 6), in the earliest ages of history, as has already indirectly been shown.

During the first fifteen centuries of the Christian era, the wheel of progress in the mill appears to have stood still, comparatively speaking. There is something remarkably striking in this monotonous state of things—a state of things, too, which comes down to a much more recent period; for in many oatmeal mills of the north and of the sister-country (Ireland), the hair sieves, linen sieves, and sheepskin sieves of Pliny's time, worked by the hand, are still in use, having undergone very little improvement in their manufacture and mode of using them.

The first English patent granted in connection with milling was in 1765 (No. 827), to a Mr. John Milne, for "improvements in machinery for dressing flour." It was a wire or cloth bolting cylinder, furnished with brushes; and since then, if we can believe the records of Her Majesty's Patent-office, upwards of three hundred additional improvements have been made in the dressing of flour! How far these have placed us ahead of the middle of the last century is a question which we shall leave for millers themselves to solve; but we may observe, in passing, that not long ago it was affirmed by one of their number that there was yet plenty of scope remaining for further improvement in this department of the mill.

To notice each of the above three to four hundred improvements individually is beside the question; and even to classify them, is a task involving some considerable difficulty. The old hand-sieves required no little professional skill to work them successfully in the sifting of fine flour; and, however well worked in accordance with the rules of the art, they always produced a smothering dust in the mill. The old rotary bolting bag was, if possible, worse in this latter respect, however closely caged in. In 1770—just five years after his first patent—Mr. Milne took out a second one for three conical-horizontal sieves, the one above the other; the latter patent being a presumed improvement upon the former, as much as to say, practically speaking, that the rotary system was defective in principle; and since ever that time a sort of pitched battle has been pending between sieves constructed on the horizontal principle and those on the rotary one, without any definite appearance as yet of victory being declared in favour of either. If we are to judge from numbers, the show of hands is doubtless in favour of the rotary principle; but numbers do not always carry the day finally in the march of improvement; so that the prudent course is to leave the question at issue an open one. In both cases, the fine flour is forced through the meshes of a similarly woven fabric; and, in each case, brushes work on both sides of this sifting fabric to keep the meshes open; so that the two modes of action in sifting are identical in principle; but the modes of applying the flour to the sifting medium are widely different, and, as yet, neither approximate the rule taught in working the hand-sieve.

The different kinds of sieves, horizontal and rotary, are so numerous as almost to bewilder those who attempt to analyze their respective mechanisms, with the view of arranging them in the order of sub-classes. The brushes, and modes of working them, are just as diversified; while the principle of the old method of bolting flour in a bag, by rudely shaking and knocking it against the sides of the flour-bin, finds favour with not a few practical minds—a method that stands something like halfway between the other two systems, the horizontal and rotary.

The plane or horizontal sieves may be divided into four kinds, thus: (1) The old to-and-fro reciprocating movement, like the riddles in some fanners, the sieve being supported on a central pivot behind, and suspended by two straps in front, and having a sufficient inclination to carry the bran over at the lower end. The meshes, therefore, or openings of the sieve through which the flour passes, describe each an arc of a circle, of which the pivot is the centre, the to-and-fro velocity increasing with the increase of the radius, it being thus greatest at the end where the bran is discharged. (2) Sieves suspended by three or more straps or bearings, and worked by a crank, so as to have a horizontal rotary movement, and, like the former, placed at an inclination so as to discharge the bran and different qualities of flour into their respective bins. (3) Fixed sieves, with brushes sweeping over and under them. (4) Horizontal rotary sieves in the bottom of the flour-chamber, between the edges of the millstones and curb, in the form of a broad ring, upon which the flour from between the millstones falls, and actuated either by the millstone spindle or by a separate and independent movement.

Bolting cylinders mostly all work on an inclination, and have, some a uniform rotary motion; others, a longitudinal to-and-fro motion as they revolve; while a third sort exemplify the old shaking action of the revolving bag, against some opposing body consisting of various mechanisms.

That a cylindrical sieve is defective in principle is manifest, as its centrifugal action consolidates the flour on its internal surface: hence the brushes, blast of air, and other mechanical means to produce the contrary effect, *i.e.*, separate the flour, and blow it through the sifting medium. Those who have any experience in sifting of fine wheaten flour, pea flour, or oatmeal, by a hand-sieve, must be familiar with the maxim of keeping the flour "alive" and moving in the sieve; otherwise it adheres together in a body "dead," in the bottom of the sieve. Exactly the same sort of thing is experienced in power-sieves, rotary and horizontal.

"I can make a better sample of flour on the old plan than on the new," said an old miller who had introduced some of the novelties of the day into his mill, and who spoke candidly what he thought and felt. It too frequently happens that those who adopt new things say as much in favour of them as possible, in order to justify the change which they have made; and so general is this maxim that the opinions of people relative to new-fangled improvements which they have adopted go for nothing, or next to nothing, so to speak. In the milling trade there is, at the present time, no little antagonism existing between commercial and manufacturing maxims and those scientific or physical principles upon which the art of manufacturing flour is based. In other words, the former looks too much to appearances, despatch, and profit, and too little to the intrinsic quality or dietetic value of the flour, upon which profit eventually must depend. Competition in the market is not a future question, but a current one, which demands despatch on the part of the miller, and a sample to please the eye, before he can command the market; and rapid grinding and dressing, in order to produce the greatest possible quantity of flour in a given time, are at variance with its normal quality. In short, the progress of mechanics in milling is just now at loggerheads with the chemistry of the subject; and, from the subtle character of the latter, we aver our go-ahead pioneers, who have gone off the line at a shunting, will sooner or later have to give up the hopeless contest, both in the mill and market.

And this is not the only antagonism that demands notice, in order to discern practically the true position of chemical and mechanical science in the mill, *i.e.*, the practical chemistry and practical mechanics of milling; for, in a previous paper, it was shown that horizontal sieves continue up to this date to be pitted in rivalry with rotary sieves; while the public palate and the public mind were beginning to get squeamish about giving hard cash for wheaten dust, ground bran, with the products of some superfine whitening and colouring processes. We shall in this paper, therefore, examine more closely the details of this branch of milling, viz., the cooling and dressing of flour, than our limits permitted in the preceding one.

Flour that has been heated and softened in the grinding, and which has otherwise undergone chemical and mechanical change, is more difficult to cool and sift than flour when it flows from the mill-eye shute in its natural state, comparatively cool and free from such abnormal and destructive processes. This arises from the tendency which the particles of flour of the former (the heated and softened sample) have to adhere to each other, thus preventing their passing through the sieve. The steam and flour are also liable to condense upon the same. The various devices for whipping, brushing, blowing, and inexplicable tossing about within the bolting cylinder may do much to keep the flour alive, and thus produce a contrary effect; but only so long as it is kept alive floating in a cloud so to speak in the middle of the machine, for whenever it approaches the sifting surface, the adhesive, condensing, and retarding properties of the flour prevent it from passing freely through; hence the devices adopted to force it by means of brushes and compressed air within, and also brushes without to prevent condensation and to keep the small pores or meshes of the sieve open. On the other hand, when the flour flows from the millstones comparatively cool, its adhesive tendency is greatly reduced, however fine it may be ground; while the condensation of steam and the mixing of this moisture with the soft gummy matter of the flour is almost wholly prevented. The difference therefore is great.

The flour of wheat which has been decorticated on the dry process or moist process, either according to the old Roman practices, or modern practices now being carried out and suggested and from which the bran and downy flocculent dust have been removed, is more easily sifted than the flour of undecorticated wheat. The flour in the former case will also be finer, being free from "clipped bran" and the obnoxious wheaten dust, provided the wheat has not been injured in the decorticating process. A similar conclusion will be arrived at in the sifting of those flours from the other ancient and modern preparations of wheat, as the Roman "*amylum*" of Pliny, and the numerous new-fangled tapiocas, &c., of our own times.

These remarks naturally take us back to a more detailed consideration of the artificial cooling processes and the battle of the sieves—the plane, flat, or horizontal sieve, *versus* the rotary sieve or bolting cylinder, briefly noticed in a previous paper. It will also be necessary to examine more closely the artificial drying and cooling of the wheat before it is ground, as this is purposely done to obviate as much as possible the disengagement of latent heat, and of moisture in the form of steam, and the absorption and condensation of the same on their coming in contact with cool surfaces in the mill in the process of dressing. Modern patentees and go-a-head pioneers of progress may talk and *do* talk complacently about their wonderful discoveries, whereby this and the next mischief is obviated, and a triumphant economy effected besides; but the true line of progress for millers to pursue is evidently to get rid of these mischiefs themselves. If the flour, for example, is not heated in the grinding, little cooling will be required afterwards; if the bran and dust are removed by decortication, there will be no clipped husk and obnoxious dust in the flour; and if the decorticated wheat is thoroughly dried, there will be comparatively no steam in the grinding, and hence no condensation afterwards; and if the seconds or coarse flour has only to be separated from the fine flour, the process of bolting will become greatly simplified. These are manifestly plain practical deductions that must be held conclusive.

To prevent heating in the grinding is obviously the true method of cooling the flour, or rather keeping the flour cool and fit for bolting. The old slow process of hand-grinding produced very little heating, although the runner rode on the grain, and it may be safely said that one of the chief causes of heating is the making a pair of millstones do more work in a given time than they can well perform, so that the miller may take up the old proverb, and say, "The more haste I make, the worse speed," all things considered.

Practically speaking, wheat or other grain, however dry it may be, cannot be ground into fine flour, without ac onsiderable elevation of temperature. It follows, therefore, that the newly-ground flour requires cooling, and in large mills artificial means require to be resorted to for this purpose. The solution of the question, therefore, is the best mode of cooling newly-ground flour, and this is doubtless by carrying off the heat as much as possible in the process of grinding, or as fast as it is ground, by the proper aëration of the stones, and by the pneumatic conveyance of the flour to the cooling, bolting, and weighing compartments of the mill afterwards, the flour being conveyed in a sufficient current or quantity of pure cool air to carry off the heat, cold being a negative quality. Cool air is the common mode of expressing air from which caloric has been abstracted, or air comparatively free from caloric, and the abstraction of caloric from the atmosphere is a process so simple and common-place, that it may be done by any miller at very little expense. The condensation and removal of moisture may also at the same ttme be effected without any additional expense; so that pure, dry, cold air may be said to be within the easy command of every industrious and intelligent miller, both for aërating the grinding surfaces, and also for conveying the flour in tubes or close passages on the old American principle of 1810 and 1813, or modern improvements of this old pneumatic system, to the cooling and filtering room, where the excess of air is separated from the flour and discharged into the atmosphere, carrying the heat it has absorbed along with it. If the atmosphere in the shade outside the mill is 60 degrees, and if this air has been cooled down to 30 degrees by passing it through ice in summer or water in the winter time, and if in the aëration of the millstones and the conveyance of the flour it has been again raised to 60 degrees, when discharged into the atmosphere through the filtering canvas partitions, it is easy to calculate the amount of caloric thus removed from a given quantity of flour by a given volume of air. And here we may add that caloric may be removed from this volume of air, both in the influent and effluent tubes; in other words, the heat will be removed by every cooled surface with which the air or flour comes in contact.

The best form of a cooling-room, in order to effect most successfully the abstraction of heat from the flour, or, in other words, the cooling of the flour, is another proposition which has given rise to much diversity of opinion—some advocating a lofty capacious apartment, with the view of comprising within it the greatest amount of space for the least outlay of capital; others advocate a long lofty narrow passage; a third plan consists of a circuitous or zig-zag passage of much less transverse sectional capacity than the second plan, but of greater length. In all these cases each plan has its own suitable contrivances for collecting the flour when cool and for conveying it to the bolting machine, such as endless brushes, traveller bands, creepers, and so forth. In principle there is nothing new in any of these old plans; but we need hardly add, they are all subject to much improvement in special mechanism.

According to some plans the flour is bolted before it is conveyed to the cooling-room. From the millstones the flour is conveyed along with a blast of air or otherwise into the bolting cylinder; and from the latter to the cooling-room, from whence it is collected and conveyed when cool to the weighing department. Under such conditions separate cooling-rooms are necessarily required for the different qualities of flour and offal. In small concerns one large department of the mill is divided into the requisite number of small ones for holding the above different qualities. In hand mills these small divisions are generally so many drawers, below the cylinder or sieve, in which the different qualities are allowed to remain until required for use.

Sifting with the horizontal ring sieve surrounding the millstones, and upon which the flour falls as it issues from between them all round the periphery, renders the performance of the sifting process before the carrying and cooling process, as in the last paragraph, compulsory. In point of fact, one of the grand objects contemplated by this method of sifting is the cooling of the flour during the process, before it is allowed to be gathered together in a body and suffer harm, as it always does, less or more, when collected by creepers or otherwise, and conveyed directly to the bolting machine, or elevated to the cooling-room in sacks, cups, or buckets on traveller bands.

In some examples of progressive grinding there are two or more ring-sieves in operation. Thus the flour from the first, or highest and central, pair of stones falls upon the first ring-sieve, which removes all the fine flour, the coarse passing over to the second pair of stones, working a step lower down; and from between these—the second pair of stones—the flour falls upon the second ring-sieve, which again removes the fine flour; and so on, the object of these progressive grindings and siftings being to obviate heating, and thus preserve the normal quality of the flour.

There are several objections to these ring-sieves that require notice. Thus when rotating at a high velocity, the centrifugal action of the flour prevents it passing freely through; and when the velocity is reduced to obviate this, there is nothing to shake the fine flour through and the coarse unground outwards and over to the second pair of stones, save the angular position of the brushes. Hence in most, if not all, those examples which have been reduced to practice, the ring-sieves have been made stationary, the operation of the brushes working the fine flour through, and the coarse and unground over to the next pair of stones below.

In the first kind of horizontal sieves, suspended by two flexible bearings or straps at the lower end, and working on a central pivot at the other, the unsifted flour and bran in the sieve travels in a zigzag path, when sifting without brushes, hair-rope, &c. In was shown in the previous article under the above sub-heading that the holes or meshes of the sieve describe arcs of circles, the arcs increasing in magnitude towards the lower end, and *vice versâ* towards the pivot, but all having a common centre in this pivot at the upper end. Apart from the force of gravitation, the zigzag lines in which the flour and bran travel downwards would be tangents to these arcs; but the force of gravitation deflects them from their tangential course, so that these zigzag lines are each less or more curved.

In the second kind of horizontal or flat sieves, suspended in an inclined position by three or four bearings, and actuated by a crank movement, the force of gravity down the inclination of the sieve prevents the flour and bran from moving in circles, so that the path of the flour, until it passes through the sieve, and that of the bran until it passes over at the lower end, is of a spiral and cycloidal character.

The old hair-rope and the more modern brushes prevent these rules from being carried out exactly according to the letter of the above scientific *data*; but just so much more necessary is it to attend to such *data*, in order to comprehend the formation and true action of these two auxiliaries—the hair-rope, and brushes; for unless this is done, the miller cannot determine whether the demands of practice have been complied with or not, or whether further improvements are required, &c.

In practice, the rotary cylinder has many advantages over the flat, plane, or horizontal sieve; but it has its own shortcomings nevertheless. The innumerable contrivances of revolving brushes, arms, screw blades, blasts of air to and fro, shaking and tossing, and so forth, furnish tangible proof in support of this, the difficulty experienced being to get the different qualities of flour to pass through the sieve, each in its own subdivision of the cylinder, uniformly with that degree of regularity and time which machine-performed labour imperatively demands. The too-common mistake is to give them more to do than they can perform well—to feed faster than they can sift. In working the hand-sieve, the common mistake which beginners fell into when the mill was like to beat them—or when the unsifted flour began to accumulate in the mill-trough—was to put too much into the sieve, thus making good the old proverb, "The more haste, the less speed;" and this applies with equal force to the rotary sieve. One defect demands special notice, viz., the collection of the flour into the lower part of the cylinder, and the passing of it through a very small fractional part of the whole sifting surface at a time, instead of through the whole sifting surface, as when the flour is equally spread over the plane sieve. Revolving or fixed brushes in the interior of the cylinder spread the flour over a much larger sifting surface than it would otherwise cover; but this only obviates the objection in a very small degree. The true plan of meeting the objection is to increase the length of the cylinder, so as to afford sifting surface sufficient to the amount of work that has to be done; but this is seldom attended to, the too-common plan being the trusting to the numerous, but comparatively useless, devices for forcing the flour through a diminished sifting surface.

In the old revolving sack it was found that increase of length did not compensate for diminished breadth of sifting surface, however good the quality of the bolting-cloth was. The hand-sieve and hand-bolt or sack required shaking; and this naturally suggested the knocking of the revolving sack against some fixed bar or mechanism. The same laws of action apply to bolting cylinders of every description.

The decortication of the wheat or other grain will greatly increase the sifting capacity of both kinds of sieves, more especially the rotary kind, as the bran not only covers the meshes or holes of the sifting surface, but also occupies space, while it less or more compresses the flour in a body by its weight and centrifugal action. The clipped and bruised fragments of husk, and the dust, from its flocculent character, close up the holes and meshes, rendering the working of brushes and the action of compressed air in the cylinder less effective. The *rationale* upon which this old Roman practice is founded, and the mechanical and chemical drift of modern contrivances to improve it, will therefore be readily understood.

PROGRESS MADE UNDER THE OLD PATENT LAW.

In this article we shall endeavour to give a condensed summary of the preceding papers on "Mills and Milling," with a view to trace the footsteps of improvement from the earliest records of history sacred and profane, down to the commencement of the present Patent Law in 1852. The reader who has had patience enough to follow us through the long series we have written on the spur of the moment, so to speak, will naturally conclude the task we thus propose a needful, but rather difficult one, owing to the magnitude and character of the subject, extending as it does over such a lengthened period of time, and covering the wide-spread surface of the habitable globe. We are indirectly informed by the sacred historian that the arts had made considerable progress in the antediluvian world—Noah's ark furnishes conclusive evidence of this; but not a word is said about the antediluvian method of manufacturing flour, and yet the practical conclusion is hardly a whit the less manifest, for the patriarch and his family must have ground their own flour during the deluge. And, again: as the human race multiplied in the plains of Shinra, so must the means of making bread have increased.

From the very little change made in the hand-mill of the Hebrews, and from the fact that similar mills have been found amongst all nations, it may reasonably be concluded that the Hebrew mill was the common one in use in Noah's time, and that when his rebellious offspring were dispersed by the confusion of tongues at Babel, the various tribes into which it was then split carried their hand-mills and mortars with them into every quarter of the globe, the British isles not excepted.

Although history is silent for a long period relative to the state of the useful arts in western Europe, it is nevertheless a certified fact, that Italy, Germany, France, Spain, and even the British isles were inhabited at a very early period, so that when Melchisedeck and Abraham were grinding fine flour the Phœnecians, Etrurians, Germans, Gauls, and Britons were at the same date also making fine flour by the same or similar mechanical means, viz., the simple hand mills and mortars still in use in the East, and which may also be seen in the north of Scotland, and still more commonly in Ireland as relics of the past. In some parts of Ireland and of the Scottish isles we are told they may even yet be seen occasionally in use, grinding meal for the family breakfast, and preparing barley for dinner: this latter we can corroborate, having been eye-witness to it.

Thus far it is easy tracing the footsteps of progress throughout the whole world, without having recourse to the common but objectionable method of invention, as if mankind had sprung from monkeys, or from a state of barbarity not many degrees above this same modern brute level. To the Greeks and Romans, who numbered their deities by thousands, little can be said for attributing the invention of grinding-mills to "the God of Corn;" but to Christians who read their bible, the invention of the mill takes them back to the cradle of our race from whence we started, some of whose long-lived inhabitants once belonged to the antediluvian world, and who consequently could have told to which of the two epochs the invention of mills belonged.

It has also been shown, in previous papers, that there is much in the details of the art of milling that is common to all ages of the world, such as the parching, decorticating, sifting, and grinding of the corn, and the sifting and bolting of the flour and meal afterwards. Historians have too often treated with levity and even ridicule the manner our ancestors used to parch their corn by setting fire to the whole produce of harvest in the field; but Pliny, who wrote in more simple and primitive times, explains the whole matter philosophically when he says "Wheat, barley, and winter wheat (*siligo*) are thrashed out. They are cleaned, too, for sowing just as they are prepared for the mill, there being no necessity for parching them (before grinding); spelt, on the other hand, millet, and panic cannot be cleaned without parching them, hence it is that they are always sown raw, and with the chaff on. Spelt is preserved in the husk too, for sowing, and, of course, is not in such case parched by the action of fire." With a pestle in a mortar, the Romans, in Pliny's time, could and did husk spelt and other grain, but not with sufficient expedition to meet the demands of general practice, and such also was the experience of our ancestors before the Christian era. And besides expedition in harvesting, stackyards and barns full of corn in the straw did not suit the warlike times in which they lived, while the fickleness and moistness of our climate in their times furnished other reasons for parching corn so as to fit it for family subdivision, storing, daily grinding and use. The Gauls, too, had likewise reaping machines for expediting the work of harvest, from which the ears of corn stripped off by the machine were immediately parched, and the corn dressed and made ready for grinding daily as required. In short, from the earliest period of history down to Pliny's time, the inhabitants of Etruria, France, and Germany, including Holland, were perhaps farther advanced in the art of milling than the Romans of South Italy, the Greeks, Egyptians, Hebrews, and eastern nations, who farmed in a drier and more favourable climate, and in the race of progress the former have kept ahead, necessity giving birth to a greater amount of discovery in harvesting, thrashing, and milling machinery, to compensate for climate and other differences.

There were, however, other reasons for parching corn than those mentioned by Pliny and experienced by our ancestors, as other kinds of corn that did not require husking were also parched in the East by the Hebrews and other nations living in a climate very different from that of Western Europe—reasons of a chemical character, in contradiction to the above, which were mechanical. Thus the meal of parched corn was considered more wholesome and nourishing than the meal of unparched corn, according to the primitive modes of baking and cooking. And not a few of the present day are beginning to subscribe practically to this old conclusion, by baking their flours in ovens, and also by a higher degree of kiln-drying before grinding. Again, when corn had to be kept in store for grinding every morning, all the year round, it was liable to the depredation of insects, mouldiness, and other injuries, from which parching would in a great degree, if not wholly, protect it.

The parching of corn was, however, a rude process, and, laterally, was not in keeping with the daily wants of the ancient Etrurians, Gauls, and Germans: hence the improvements which were made in hulling and decorticating mills by the Etrurians, Gauls, and Germans before the Christian era, and which have since taken place, and are now in progress of being carried out. Corn was stored, for example, in the capacious barns of farmers, and in the granaries of walled cities, instead of in the tents and huts of nomadic tribes. The old Etrurian and Roman pestles and mortars were superseded by hulling-mills and hand-mills—by wind, water, and tide-mills. History informs us that the lava quarries of the Rhine have supplied Italy and a large portion of Europe with mill-stones for upwards of two thousand years, mill-stones of two kinds—(1) mill-stones for hulling and decorticating, and (2) millstones for grinding. Those recently dug up from the ruins of Pompeii were evidently of the former kind. It would therefore be unreasonable to conclude that ancient Germany and Gaul were behind the Etrurians in the manufacture and use of either of these two kinds of mill-stones; for the weight of the practical argument manifestly bears down the opposite scale: moreover, both these kinds of mill-stones have come down to the present day.

Dropping the progress of grinding mill-stones for the present, and confining our remarks to decorticating-mills for making pot and pearl barley, they were introduced into England by one Eustace Barnaby, about 1661, under patent No. 133 of the old statute, and into Scotland by Mr. Meikle, in 1710, from Holland. Mr. Meikle brought over fanners which are said to be of Chinese invention, and to have been introduced into Holland two hundred years before the above date, or about A.D. 1500. The Dutch pot-barley mills are horizontal ones, with circular master-furrows from the eye to the circumference, similar to the master-furrows of the Tuscan mill-stones for grinding, the curvature of the furrows being intended as an approximation to a hyperbolic spiral. Under the article "Barley," in "Tomlinson's Cyclopædia of Arts, &c.," will be found a drawing and letter-press description of a Dutch pot-barley mill-stone, and also of the vertical grind-stone mills now generally in use in Scotland for making pot-barley, together with the mode of using them and covering them with a hood, so as to prevent the waste of the stive or barley-dust through the mill. To our non-professional readers we may observe that pearl-barley is pot-barley kept a little longer in the mill, so as to reduce it to a greater degree, or until the whole of the husk is removed. The former (pot-barley) always has some of the husk adhering to it, when the barley is decorticated in a dry state. When slightly moistened, by passing it over a wet cloth, or by the watering-pan and rapid turning of the grain, or by steam, so as to loosen the husk, but not soften the kernel—a common practice in Holland—the husk and dust were more completely removed in the mill, but not so well as in the mortar, when the barley was moistened in a much greater degree. Hence, in Inverness-shire we found an example where a Highland farmer preferred the pestle and mortar in making his own pot-barley to sending it a short distance to the mill. And, we may add, the Dutch millers, from the superiority of their pot-barley, did an extensive business in its manufacture. They also had an extensive trade in the manufacture of groats from oats, split peas, &c.

About the beginning of A.D. 1797 a Mr. Ferryman obtained a patent (No. 2,158) for a machine for blanching and dressing corn, *i.e.*, decorticating wheat. It consists of a horizontal conical roller, furnished with leather and cloth for rubbing the bran, or outer husk, off the kernel of the wheat. Below the decorticating mill is a fan for blowing away the bran and dust thus rubbed off. The clean decorticated wheat then runs down a shute into a conical stone grinding mill, upon the spindle of which is a rotary disc sieve below for sifting.

From A.D. 1800 to 1801 extensive experiments were made in the decortication of wheat. A series of these was laid before a committee of the House of Commons by the then Duke of Bedford, May 22, 1801, along with samples of the flour thus made from blanched wheat, which, his Grace said in his evidence, made "*infinitely better* bread than the bread made according to a late Act of Parliament." His Grace further evidenced that, "in erecting a new mill, no additional expense would be created except the building of a kiln." But, on the other hand, his Grace stated that the flour of blanched and kilndried wheat was darker in colour than flour made in the ordinary way: hence prejudice was raised against it as being adulterated, and so forth. This prejudice is easily accounted for; for millers, about that time, were loudly accused of mixing all sorts of qualities to make up the quantity in times of scarcity.

In the above two examples we have an illustration of two practices in the decortication of wheat for grinding, the wheat in the former (Ferryman's plan) being decorticated in a dry state, or not moistened to a greater degree than was necessary for immediate grinding; whereas, in the second or Bedford plan, kiln drying before grinding was absolutely necessary. And it is instructive to consider how closely these two examples coincide with the experience of Roman millers at the time when Pliny wrote his Natural History, and also how closely they coincide with the experiments now being made to reintroduce this old system under improved chemical and mechanical conditions, as will be shown in a subsequent paper. Thus, Pliny says, book xviii. chap. 23, "I shall here set forth the opinion given by Mago as to the best method of pounding corn. He says that the wheat should be steeped first of all in water, and then cleaned from the husk; after which it should be dried in the sun, and then pounded with the pestle. The same plan," he says, "should be adopted in the preparation of barley. In the latter case, however, twenty sextarii of grain only require two sextarii of water." The authority thus quoted by Pliny wrote twenty-eight books on husbandry. He was a Carthagenian, the brother of Hannibal. And we may farther add, that the Arabs of North Africa and Arabia are said by Neibuhr to prefer flour produced by pounding or rolling to that made by grinding. The modern plan of decorticating wheat we shall briefly notice in a subsequent article.

Returning to the grinding mills of ancient Etruria, a part of which is now known as Tuscany, it was shown that the Roman qualities of flour very closely resembled those of England and France at the present day, superfine grinding and dressing being carried to an extreme in Pliny's time. It was also shown that Tuscan millers dressed their millstones differently from what our millers do, the furrows being laid out in a curved form. Our own mathematicians have recently demonstrated that the arms and vanes of fanners should be bent from the spindle in the curve of a hyperbolic spiral, and the same scientific data apply to the furrows of millstones, both for decorticating and grinding. Hence the old Etrurian or Tuscan rule, and hence also the discoveries which modern millers and inventors are beginning to make in England and America!

From the close resemblance of our old English mills to those erected in Italy under Vitruvious, and described by him in his works, which we quoted at some length, it is generally concluded that the Romans erected water-mills in England, and that they continued in use with very little improvement up to the commencement of last century. During this long period France, Germany, and Holland got ahead of us in the march of improvement; but since then our millers and millwrights have bestirred themselves in every branch of milling. In the "Gentleman's Magazine" numerous writings to this effect will be found, and also drawings of wheat-dressing-machines, hand-mills, &c. Thus, in vol. xvi., p. 640, Dec. 1746, a drawing and description are given of a machine for "rubbing, cleaning, aad winnowing corn all at once. Vol. xxviii. p. 26, drawing, &c., of a hand grinding-mill. In vol. xxxv. p. 439, Sept. 1765, we are told a model of a new grinding-mill was brought from Paris; and in April, 1769, a drawing of Freeth's patent mill, No. 903. And at an earlier date than any of the above, Mortimer, in his well-known and oft-quoted work on agriculture, suggested vertical mills on the grindstone principle, or edge-grinding cylinder. The French military mill introduced was a side-grinding cylinder, working also vertically, like Mortimer's. The Society of Arts also did everything in its power to stimulate progress, while extensive public experiments were made under our most talented engineers of the day. Altogether, the last century was productive of much improvement in mills and milling, a detailed account of which will be found in scientific works of that period, such as the fifth edition of the Dictionary of Agriculture, formerly quoted.

The improvements made during the first-half of the present century, or up to 1852, have reference chiefly to cool-grinding and the economy of corn and flour. The application of steam as a motive-power, a greater amount of heavier and more effective machinery, with the abridgment of manual labour in the dressing department, and competition in the trade, naturally threw upon the millstones more work than they could well perform. Hence the contrivances invented and resorted to purposely to obviate heating and other short-comings thus experienced, and also to expedite the process of grinding. A condensed synopsis of these will be found in our second article, unde 24 subheadings, and covering upwards of a hundred patents, involving principles and mechanism and processes, all of which are now public property. About the commencement of the present century, it must also be observed that the millers of the United States of America became the rivals of our own millers, sometimes the one side and sometimes the other taking the lead in the march of improvement. By the former the pneumatic system of conveying and elevating grain and flour was invented, about 1810 to 1813, a system which is now beginning to create some little stirring promise on this side the Atlantic. Exhaust and blast vanes upon the periphery of the runner were used in this country about the close of last century, the first English patent dating 1799, No. 2,336, and the first English patent for supplying currents of air to the grinding surfaces of millstones is dated 1843, No. 9,876. But the writer of the article "Mills," in Morton's Cyclopedia of Agriculture, says, "A mode of grinding and dressing, said to be extensively adopted in France, has been introduced to some extent in this country. The improvement in grinding is effected by making the eye of the runner-stone air-tight, and introducing from a rapidly revolving fan a current of air between the surfaces of the stones. The mill-hoop is also rendered air-tight, and is exhausted by the motion of another fan, and thus all the heated breath and moisture evolved in the process of grinding is carried off from the meal. We have, however, seen as good flour made without this apparatus, *cæteris paribus*, as with it, and quite as economically." To the soundness of this latter conclusion we cordially subscribe. In short the general conclusion at which we arrived in the series of articles on the above 24 subheadings, comprising the substance of the claims of 109 patents, was, that millers were allowing patentees to blow dust in their eyes at the expense of their flour, and that they must go back and begin at the American pneumatic system.

GENERAL VIEW OF PATENTS UNDER NEW STATUTE FROM 1852-1865.

Under the old statute, about 109 patents were granted in connection with the art of milling; and under the new, up to the close of 1865, 339, making a total of about 448, as formerly stated; and to this long list of pretended improvements must be added between five and six hundred American patents imported into this country, and which are regularly published for public benefit: it follows that on an average there is an annual crop of twenty-five English patents, and rather over this number of American ones. Of these about two hundred have already been discussed in principle in our previous papers, leaving about 800 to be disposed of.

It is a common saying that "only a very small per-centage of patented projects see daylight beyond the murky regions of the Patent Office," and this old remark applies with as great a degree of truthfulness to patents in connection with mills and milling as to those in connection with any other branch of applied science. A large number of applications under the new statute never "proceed to the GREAT SEAL" (quoting an official expression); a second batch fell to the ground at the expiry of three years, so that more than two-thirds of the whole 339 are now no more. To say that these two-thirds are now public property would no doubt be true in one sense, offering no little relief to narrow minds, altogether opposed to the propriety of granting patents; but, to speak the honest truth in plain English, the vast majority of them were never anything else than public property, being wholly devoid of novelty, some of them having been patented under the old statute several times. In short, twenty-five inventions annually claiming from two to a round dozen distinct improvements, each may be taken as a practical solution of its own absurdity—so to speak—for at this rate of progress very few would have been able to keep pace with millers, while half the world and something more would have lost sight of them altogether; but the fact that mills and milling are rather behind in the race, and that millers are associating for the express purpose of getting rid of Patent Office flood water, now tailing back upon them, furnishes tangible proof to the contrary—*i. e.*, only a very small per-centage of the above claimed improvements are worth anything, and some of those which do not proceed to the Great Seal are worth more than others completed and in operation at the present day.

Of the American patents above referred to, a few are annually extended to this country within the statutory privileged time, but the vast majority of them are now published in this country very shortly after the publicity of the American Patent Office publications of the United States at Washington, and not a few of them before that time are described and illustrated in the *Scientific American* and other periodical publications of the United States, which have a circulation in England, the time of transmission across the Atlantic being seldom more than fourteen days. It follows that English inventors should examine very closely these American publications in the library of the English Patent Office, where they are now carefully filed and shown to applicants. This they should do personally before they take the first step of applying for provisional protection; for if they did so they would often save themselves no little trouble and expense, and the general public much unnecessary obstruction to progress. On the other hand, if American inventors would examine the publications of the English Patent Office, now regularly filed at Washington, before advising their agents in this country to patent their projects here, they would be equally the gainers. Strange to say, however, very little attention has been paid to this precaution on either side the Atlantic in the case of mills and milling, prior examinations, up to a very recent date, being left entirely in the hands of patent agents. At the present time rather more care is being taken than formerly, but for the first ten years of the working of the new statute very little circumspection of this kind appears to have been used in this branch of patents. Hence the perturbating mass of confusion from these 800 patents, English and American, some of them pretending to cover in their claims no fewer than a dozen of important improvements, to the best of the patentee's knowledge. Things, for example, that were patented in the United States of America half a century ago—such as the pneumatic system of conveying and elevating corn and flour, to which we have turned attention—are being patented in England in 1866, and, *vice versâ*, things that were patented in this country half a century ago are now appearing in the Patent Office publications of the United States as modern Yankee discoveries! And even this is not the most amusing instance of inattention to the progress of former times; for in both countries, England and America, the Tuscan or ancient Etrurian method of dressing millstones as practised by millers in Italy about the commencement of the Christian era, have of late been re-discovered and patented as modern improvements of infinite value! As to "Mortimer's grindstone," as it has been called, of A.D. 1710, it appears, like the eagle, to renew its age at the expiry of every ten years or so! Exactly the same thing may be said of the old Roman method of decorticating barley, wheat, and other kinds of corn, now being discovered and patented with an apparent air of triumph, as if the most distant approximation to anything similar had never been heard of before. An interesting anecdote bearing upon this branch of milling took place at the Smithfield Club Christmas gathering of 1866, in the Agricultural Hall. On coming up to Stand No. 152, Jas. Hughes and Sons, we there met at the big "bed-stone" an intimate old friend in connexion with the corn and milling trade, now retired from business, his place in the trade being filled by his family. Of course the subject was of the practical kind, viz., milling; and accordingly the special qualities of French burrs, Derby Peaks, and German lavas, and what they were each and all best adapted for, were questions that were soon put and solved. A grain of wheat was next dissected, and the finest and more valuable portion of the flour pointed out as lying immediately below the husk or bran and downy substance that lies underneath—in other words, the outside of the kernel. This brought us to the manufacture of pot and pearl barley, and the loss sustained under the modern practice. When we put the plain practical question to our friend, "Do you remember seeing the old women making pot barley in a stone trough or mortar?" without a moment's hesitation he replied, "Yes; and stirring it up with the rib of an ox." "What? the rib of an ox!" said his son, who was escorting him through the Hall, as if he did not exactly understand the working details of the practice of the last century thus under review. "Yes, a cleaned ox-rib from the dinner-table, because they could find nothing readier and better for stirring up the moistened barley, so as to skin it evenly." Such were the ready answers given, proving that the whole *modus operandi* of this old practice of decorticating barley was as fresh in his memory as it was when an eye-witness to it, about the close of the last century.

The professional reader will perceive that the above passing conversation forms a practical summary of much that we have discussed in previous papers on this particular branch of milling, while it at the same time throws fresh light upon our present position as regards the manner in which the 800 patents not yet disposed of should be discussed in the columns of the *Mark Lane Express*. True, we have gone through these 800 patents, one after the other, up to the close of 1865, and have not found any patentee claiming the invention of the "rib of an ox" in our modern processes of making pot and pearl barley, or yet in the decortication of wheat on the old Etrurian, Saxon, and Celtic plans of Italy and England in the olden time, so that this discovery is open for patent; but Ferryman's process, and that to which his grace Francis Duke of Bedford turned the attention of a committee of the House of Commons in 1801, to both of which we have turned special attention, are virtually being rediscovered and patented, both in principal and special mechanism, as modern novelties and improvements in milling! How are we to discuss such patents? They are manifestly improvements, some of them, upon the old; but owing to the patentees being wholly ignorant of the old patents, and the improvements made upon them in their reduction to practice which were not patented, owing to the great expense of taking out patents in those days, they claim in many cases what the old patentees claimed and did; but they leave unclaimed their own special mechanism and improvements.

To make a long story short, there are in the above state of progress in milling two kinds of rights at issue—private rights and public rights; and we aver, with all due respect to those who may think otherwise, that it is our duty to protect the former as well as it is our duty to defend the latter, and therefore that the proper course in discussing the 800 patents is to afford the two parties sufficient time to arrange matters between themselves—the former, the patentee, by disclaiming where that is practicable, and where it is not, by making the best arrangement he can with the latter—that is, with those implement-makers and millers who are paying him royalty and licence. Under the latter hypothesis, and not unfrequently under the former also, the more profitable plan for the patentee to pursue would be to take out a new patent for improvements, and abandon the old patent altogether—a course to which he may be looking forward at the expiry of his old patent under the fallacious idea that all is right at present—a line of proceeding which also requires time to carry it practically into effect.

In the above contrast, we have purposely placed the rights of patentees before those of the public, because the former are the weaker party. The interest of the public at the present time is, however, very imperative, for no empty patent claims can be allowed to stand long in the way of progress. In other words, the rights of inventors and patentees are divided—those of the one side imperatively demanding the immediate removal of all the empty claims and patented bubbles out of the way, in order that the wheel of progress may be shouldered up-hill without experiencing longer any unnecessary obstruction. The interest of this side in the general question at issue is thus a very clear one; but that does not furnish a valid reason or plea that would justify any party pocketing the interest of the other; for empty claims only stand in the way of those whose ignorance of past progress is as great as is that of those who make such empty claims. There are no doubt thick-headed people on both sides, whose ignorance in question is not greater than their selfishness, who may conclude—the one (say Mr. A) that it is our duty to tell him what he should disclaim, or how he should improve his mill so as to enable him to abandon his old patent, in the event of that being the more desirable course; and the other (say Mr. B) that we should tell him that Mr. A's patent is a bad one, giving publicity to the number and date of his patent, and so forth, so as to enable him to set it aside, and thus improve his mill before Mr. A has had time to cover his interest in the matter by a new patent. Such a course applied to the whole eight hundred patents under notice would form rather a voluminous affair, were we only to quote the short titles and claims appending to each "good," "bad," or "disclaimer," as the case might be. But the information sought under the above conditions contemplate something more lengthy than the monosyllable good or bad; for, according to the old adage, "it is no easy thing knocking knowledge into heads that are thick naturally." A third party—Messrs. C, D, E, and Co. —may say, in reply to this: "There are only about fifty out of the eight hundred patents or so that stand in our way: give us a public criticism of them, such as will enable us to set them aside." The next party may say forty out of the eight hundred; the next, thirty, and so on. But those who take this narrow-minded view of the public and private interests at stake should bear in mind that if there had been fifty, forty, or thirty good people found in Sodom and Gomorrah, they would not have been destroyed, and that those fifty, forty, or thirty patents may be the very ones which it is our bounden duty to defend until their owners have had time to disclaim, or otherwise dispose of the interest they have at stake.

We have thought it advisable to make these preliminary observations on the present state of patents in connection with milling, owing to the peculiar feeling on the subject which very generally pervades the minds of millers, that something is wrong, and that they are not receiving justice at the hands of the agricultural press. But the very reverse of this conclusion represents the true position of things; for they have no right to blame any other body for the upshot of their own want of information as to the progress of their own profession, past and present. Were the art of milling a modern discovery of only the day before yesterday, we could understand why a practical miller or millwright might conclude that the past was rude in the extreme, and that this and the next thing were true and first inventions; but when it is borne in mind that kingdoms have existed in a very high state of civilization, and possessing a high degree of knowledge, reason surely demands that millers and writers on milling should make some inquiry as to the state of progress when such kingdoms were in the zenith of their glory, such as the Roman, Greek, and Eastern empires. No doubt, the records of history are not very explicit on the details of milling; but we have shown that sufficient has been recorded to satisfy any intelligent and unbiassed mind that the Romans, in Pliny's time, had made considerable progress in the art, and that they were well acquainted with the principles of milling generally, being much farther advanced in this branch of manufacture than in some others. As to the quality of the flour in Pliny's time, if we are to be guided by the drift of modern discovery and improvement at the present time, it was equal, if not superior, to much that is now made.

The scientific reader will, no doubt, receive our remarks as an apology, in accordance with common rule, for the anomalous state of progress in the art of milling, seeing that millers are associating to defend patents which they ought to be ashamed at having ever used, and that we are thus preparing to avoid making conspicuous exposures of the individual patentees of such patents and their silly customers who are paying licence and royalty for them, and for old things that have been public property for ages past, and that we intend to dispose of the eight hundred patents in three or four papers, by classifying them under a few heads—not according to patented claims, as in the preceding papers on patents under the old statutes, but according to the different lines of progress or objects sought to be attained, with the twofold view of stimulating progress on the one hand, and of pointing out to patentees and millers generally deviations from those lines; likewise, what has already been shown to be public property in principle, which therefore cannot now be claimed in patents as new in principle—claims, under such conditions, being exclusively confined to special mechanism.

1.—MILLSTONES: QUALITY, DRESS, AND MOTION FROM 1852 TO 1865.

1. In milling, as in all other branches of manufacture, there are certain topics that more particularly engage the pursuit of the pioneers of progress than others—certain objects to be attained that have not hitherto been attained; and such objects generally divide themselves so as to form distinct or separate lines of progress in the different branches of the art or departments of the mill. Thus we have the different kinds of millstones, as French-burrs, Derby-Peak, Cologne or black lavas, millstone grit, &c., each having something peculiar about it, which adapts it for certain purposes, but unfits it in some measure for others in a comparative sense, taking into consideration their prime cost and subsequent expenses. Then there are the different modes of dressing, and the general question, Can art produce a better quality of millstone than the above and other examples obtained from nature? and can our common mode of dressing be improved upon? These form, as it were, the first line of progress.

2. Grinding and the aeration of the stones, together with the feeding and aerating machinery and apparatus, form the second line.

3. The preparation of the grain to be ground, including cleaning, scouring, decorticating process and machinery, form the third line.

4. The dressing of the flour, including its conveyance from the stones, sifting, &c., with the machinery and processes thus involved, form the fourth line of progression.

To some one or other of these four heads all the claims of the eight hundred patents not yet disposed of belong; and in a few papers, one or more to each, we shall endeavour to give the reader a general idea of them, sufficient we hope to enable millers to keep pace with the times, and even to go a-head without infringing anybody's patent, provided always that the necessary attention is paid to special mechanism. In other words, we have examined all the above patents, and cannot see in them anything that stands in the way of future progress, if millers will only take the trouble to make the necessary inquiry as to what others before them have done under each of the above four heads.

† Most millstones have been analyzed, to determine their hemical constituents, and how far the latter affect their quality for grinding and other purposes.

Another old proposition, the adoption of one kind of stone for a runner, as a Derby-Peak, and another kind of stone for the bedstone, as a French-burr, and so on, still continues to engross the attention of millers, the voice of experience up to this date having arrived at no satisfactory or established conclusion based on scientific data. True, many millers express their opinions on this head very freely and confidently, as if they (such opinions) could not be overthrown; but when confronted with men who have taken a deeper and more extended view of the matter, such opinions are at once thrown aside, or only received as exceptional—*i. e.* conclusions deduced from an exceptional or limited experience.

Practical questions of the kind at issue resolve themselves into three kinds. 1. Commercial questions involving expenses; 2. Mechanical questions; and 3. Chemical questions. With the former two kinds of questions, the commercial and mechanical, millers have long been familiar; but only in what must be admitted a limited sense, as will immediately be shown. But the chemistry of the past differs so widely from the chemistry of the present, owing to the rapid progress recently made in this branch of science, as to leave the vast majority of millers in the dark as it were, in regard to the quality and action of millstones.

In all branches of milling, more especially grinding, the commercial and mechanical conditions involved very much depend upon the chemical; so that recent discoveries in the matter have overthrown many of the practical conclusions of millers relative to the former. If Peaks, for example, can be got at little more than one-third of the price of burrs, that may be a practical reason for some millers crossing their burr-bedstones with Peak-runners, or *vice-versâ*; then Peak bedstones with burr-runners. Black lavas and millstone-grits may likewise be crossed with burrs and Peaks, for grinding oatmeal and other purposes—the difference in their expense turning the balance in favour of their use, taking into consideration the mechanical questions of grinding and dressing, and also the chemical questions involved in heating, or the liberation of latent caloric, and the generation of steam, &c. But, in all questions of this kind, the experience of the vast majority of practical millers is limited to a very few examples of crosses of the kind at issue; while the liberation of electricity, and the effect produced by such along with caloric upon the flour, more especially upon its odorous, sapid, and soluble properties, are questions upon whose solution they can seldom offer a single opinion as to the effects produced by the crossing or no crossing of different kinds of millstones, or even surmise what different modes of dressing and aeration may produce under such chemical conditions. No doubt, some practical millers, like some practical farmers and most practical men in other arts, are ever ready with their opinions; and the less informed they are on the science of their practice, the more ready formed are their answers to such questions, however difficult, abstruse, or even undetermined by discovery they may be; but, as a matter of course, to all such opinionative men the usual allowance of tether-length must be given, their answers being for the most part evasive, and beside the question. We once had a professional chat, for example, with a shrewd, intelligent miller, in his own mill, and who was grinding for us at the time. It was beginning to get dark, when a fine tom-cat, in its round, bespoke our friendship in the usual way. We stroked Charlie's back rather roughly, making the electric sparks rise very visibly therefrom, no less to the amusement than the surprise of Dusty Coat, who had never seen the like done before. All the while we had an eye upon the millstones, which were grinding rather soft and greasy at the time; and so we put the question abruptly, thus: "Do you think the millstones are playing at that electric game?" "Eh! by dad," rather hastily, was the only reply we got, the practical importance of the interrogatory being so thoroughly understood as to effectually shut the clack-valve of his opinionative philosophy during the rest of the milling; and to this day, we aver, the practical question remains unsolved in the same mill. We shall have occasion to return to the question of caloric, electricity, steam, and volatile matters, under another sub-heading, that which belongs to our present heading being the quality of the millstones, and their liability to set free caloric, electricity, &c., or produce any other chemical action or change in grinding injurious to the quality of the flour.

How far, or in what degree, electricity is excited by the action of millstones in the grinding of grain—differently by different kinds of stones and qualities of grain, and also states of the atmosphere—are questions into which we do not go further at present. We put the above question to the above miller some thirty years ago, purposely to silence opinions which he was advancing relative to the effect produced by different states of the atmosphere, without his being able to show the physical data which those opinions were intended to represent. And thus far, the question served its purpose; for the miller being extremely fond of discussing physical topics in connection with milling, the one thus stated gave him something to ruminate upon. He at once saw, for example, that the question of electricity was so inseparably connected with those of heat, atmosphere, and other chemical phenomena, that opinions on any one of them could not legitimately be advanced without a satisfactory solution of the others at the same time; and we allude to the question just now for a similar reason, to check fallacious opinions, there being an anomalous amount of speculative hypotheses or hypothetical notions of this kind abroad, which have little or no connection whatever with the facts of the case which they are intended to represent in the mill. In other words, millers are sensible of the effects produced; but, instead of reasoning philosophically, by tracing step by step the physical data or effects thus produced to their legitimate causes, they make a long jump in the dark by guessing the matter, although the physical data are far the most cognisant to the senses, either to the eye, or else to the organs of taste and smell, and not unfrequently to the touch too, as the handle of the flour, or grain, or offal, so that they can be easily traced backward to their causes, or from the causes forwards to the effects produced, and so on. Hence the erroneous conclusions arrived at (the useless inventions resorted to) for the purpose of obviating evils which ought not to exist—the obstructions thus thrown in the way of progress, and the sacrifice of much precious time, professional labour, and capital.

Invention has hitherto done very little to improve the chemical nature of millstones, which we have imperfectly glanced at above. Artificial millstones have, however, been made in great variety, but rather with the object of improving their mechanical structure than their chemical quality. The former, however, cannot be done apart from the latter, so that the chemical question, practically speaking, has been under solution in various ways. Thus there is a chemical as well as a mechanical difference between the artificial millstones of Hamilton, noticed in a previous paper, and those of Ransome's and other patentees, to which we must now turn attention; while there is a growing belief amongst scientific men that *art* will one day beat *nature* in the production of millstones for grinding grain.

Up to 1852 mechanical questions are those which chiefly engaged the attention of millers and the pioneers of progress, and they continued to do so down to the close of 1865; and this, too, applies to Britain and the United States of America, and also to the continent of Europe.

The mechanical questions thus sought to be solved have reference to the form, dress, and motion of the grinding-surfaces of millstones, including surfaces for progressive grinding and shealing; the object sought being also of a mechanical character, as specified, generally speaking, such as to avoid "clipping" and "greys" in the flour; "killing," "dust," or "flocculent stive," and so forth. But although the objects sought and specified are chiefly mechanical, various chemical data are also understood, and indirectly specified under the general designation of "quality of the flour." True, one patent, No. 1,757, A.D. 1855, especially specifies means for obviating "the deperdition of aromatic and other matter;" but although there is some novelty in this mode of specifying, the patentee fails to designate what those aromatic properties are, in accordance with the requirements of physical science, while there is no novelty whatever in the mechanical means he uses for obviating deperdition, such having been used before 1852.

Under each of these heads there has been an immense amount of pretended novelty claimed in the form of improvements, and not a few important actual advances have been made since 1852 in special mechanism, but unfortunately these advances or real improvements in special mechanism have very seldom been specified and claimed, while that which possesses no novelty has been clearly specified and claimed. There is something so conspicuously anomalous in this, both in the English and American patents, published since 1852, in the English Patent Office, and in a great many public offices besides where the English and American publications relating to patents are now regularly filed, as to call for public exposure, if not reproof. A great many of these useless patents have been obtained by private individuals and non-professional men who can well afford to burn their fingers now and then; but not a few of them are by millers and millwrights, who ought to have known better than to claim what belonged to their ancestors ages past, now the property of the public; and to leave unclaimed what are really their own inventions. So long as a miller remains at home in his own mill, we can appreciate the improvements he makes from his own isolated point of view, and give him full credit for them; but when he enters the national patent office, and challenges the pioneering talents of all the world outside his own mill, the least that common-sense demands before loosening his purse-strings is to inquire what all the world has done before the date of his discovery; or, more practically speaking, the old Etrurian form, dress, and motion of millstones, and the various plans, noticed in previous papers, as patented and used in this country and in the United States of America, and likewise on the continent of Europe, were each and all subject to many special improvements at the close of 1852; but to make a few of those special improvements, and then to leave them unspecified and unclaimed, and to specify and claim the old improvements in their place, must be looked upon as some degree worse than silly and near-sighted, practically speaking.

It is easy accounting for much of this similarity of and imitation to progress; for as experience is the true master-teacher in all real improvements, the same schoolmaster who taught the ancient Etruscan, Carthagenian, German, Gallic, and Roman millers how best to form, dress, and hang their millstones, is now abroad, teaching in England, America, and the continent of Europe; hence the similarity of discoveries made during the last fourteen years, so that the imitation of the millers in the latter case arises from their overlooking how experience taught and guided the wheel of progress in the former. Thus the conical surface of Etruscan hulling millstones, the concave and convex surfaces of the millstones of grinding-mills, the circular or curved style of dress, the placing of the bedstone uppermost, of a runner between two bedstones, grindstone runners, concentric and eccentric motion of the runner, are all old, having been used long prior to 1852; and yet up to 1865 they have each been patented as new, and some of them several times, with some little diversity of special mechanism; but this diversity of special mechanism, often of no great value, it is true, has not been specified and claimed as novelty, while much of the old has been so claimed. If we refer to the details of constructing and hanging millstones, there is perhaps more real novelty observable; but the same proneness to claim old things, because the more important, and to leave unclaimed new things, because of less patent value, manifests itsself in a very conspicuous manner both in English and American patents. In the artistic character and general construction of millstones, and the gearing by which they are driven, a vast improvement has doubtless been made during the first half of the current century; and during the last fourteen years many old mills have been gutted out, or supplanted with bran-new ones; but although this has been greatly in favour of the province of the implement-maker, or of mills from an engineering point of view, it is very problematical if such improvements have been in favour of the quality of the flour, for the riding, rocking, and oscillating movements of the Hebrew chariot, or runner of the hand-mills, and the rattling of cog-wheels and trundles, were much less liable to produce heating and harm to the flour and meal, than that which is produced by our modern mills where revolving spindles move more true and evenly, but at the same time more rigidly killing to the grain being ground between them. Hence the proposition of A.D. 1859, No. 1,145, "for suspending each stone or apparatus similar to jimbals, so that it is free to incline in any direction." Also that of "oscillating bedstones," No. 692 of the same year (1859). Experience has also during the last fourteen years turned the attention of American inventors to the same data, hence they have patented similar jimbal and oscillating projects. They have also patented the curved style of dress, and the rounding-off of the edge of the furrows to obviate clipping; both of which were used by the Romans and Germans centuries ago, the black lava millstones used by them being very liable to clip, and produce greys.

PROGRESS IN THE AERATION OF MILLSTONES FROM 1852 TO 1865.

The origin of the term "*Dusty Miller*" takes the mind back to ages long gone by, and so does the proposition of doing away with it (*i. e.*, the floating stive in the mill); but the practical solution of this latter proposition by mechanical means belongs to our own times, comparatively nothing having been done prior to the middle of the last century, and very little until about the commencement of the present one, when fanning apparatus began to be placed upon the periphery of the runner. Shortly after this (A.D. 1800) the millers of the United States of America began to use detached pneumatic apparatus for conveying, elevating, and removing the flour to the cooling and dressing department. The French millers followed, as stated by J. Ferrabee, Esq., under the article "Mills," in Morton's "Cyclopædia of Agriculture," quoted in a previous article. The plan was introduced into this country, both from France and America, and between 1843 and 1852 we have taken notes of upwards of twenty patents, the most of which claim something or other in connexion with the aeration of the millstones, and the removal of the flour therefrom. Some grasping patentees, included in the above list, claim as if they had covered everything before, as well as after the date of their patents—as if all millers and patentees prior to the date of their patents had never done anything, and as if all future patentees could not make a single move in advance for fourteen years and five afterwards. Nevertheless, between 1852 and 1865 we could read upwards of a hundred claims for improvements, or rather pretending improvements, in the aeration and removal of flour, stive, steam, and heated air from the stones and mill case—and but for the unbridled litigious animosity which has prevailed to prevent the wheel of progress advancing any further in this direction, it is more than probable that millers should have had an additional hundred claims for pretended improvements! But be this as it may, from a neutral point of view there is something interesting in the milling race of progression; and not the less enlivening feature in the motley go-ahead movement is the circumstance that the above grasping and litigious patentees have the wrong sow after all by the ear! while our patentees and not a few professional practicals are following hard after, confidently assured of the contrary (*i. e.*, that they have "the right sow by the ear") ! ?

In other words, our practical conclusion relative to the progress made in the aeration of millstones, and in the removal of flour, stive, and heated air therefrom, up to 1852, was not favourable, there being a manifest lack of knowledge of past progress and of modern chemical science in the mill; and we regret to say, that up to 1865 comparatively nothing can be reported to the contrary. Whether this untoward state of things is to be attributed to the immense amount of expensive litigation that has taken place, or to the successful manner non-professional patentees have blown the floating stive in the mill into people's eyes, are questions which we shall not presume to answer; but that the pioneers of progress have been galloping along the many bye-roads that wind about on either side of the true line of progress, is proved by the three hundred and thirty-nine patents applied for since 1852, and also by what has been done in mills as to improving the aeration of millstones.

It is not to be inferred from the above that no progress has been made, indirectly, as it were; for although off the true line of progress, much experience has been acquired under the new but erroneous plans, which in themselves are much better than the old ones. In other words, to follow up the above comparison, the old road was so deeply rutted, that travelling in the bye-roads on either side was found much more easy and agreeable. There can be no mistake about this. But why leave the true line of progression at all, when a very sober amount of engineering would have carried the line over the valley and under the cloud-capped hill a-head?

We also concluded that when the Patent Law Amendment Act came into operation, towards the close of 1852, there were then no patents in force that stood in the way of progress, or of forming the true line right ahead, let litigious patentees and stive-blind millers say what they may to the contrary; and the same conclusion applies to the close of 1865. Or, to bring home the subject to every mill in the kingdom, in language that can hardly reasonably be misconstrued, at the close of 1865 there was not a single patent of the 339 which we examined that stood in the way of any miller improving the aeration of his millstones in the right way; for this he could do, without infringing anybody's patent. No doubt, every miller may not see the right way ahead. It may safely be taken for granted that very few millers see so far before them. But facts of this kind do not form a single objection or argument to the contrary. True, once off the line, and bewildered in the bye-ways in which patentees have been groping their way, right and left, as they best could, and then at the close of 1865, probably fifty patents may be infringed. As a popular rule, it may not inaptly be laid down that those who thus infringe such patents ought in fairness to pay the piper.

From what has already been stated in a former paper as to the impropriety of noticing individually the personal doings of patentees under such conditions, even granting that the immense number of patents would otherwise permit such a course, what we further propose is, (1) briefly to review the philosophy of aerating millstones, (2) the several plans adopted for carrying out the same into practice, (3) the erroneous plans into which a large number of the pioneers of progress have fallen, and (4) the course for millers to pursue so as to avoid the infringement of the patents of those who have left the true line of progress, in hopes of reaching the winning post more easily on bye-roads on either side.

(1) English wheat contains about "15 per cent." of water, quoting Johnston's "Lectures on Agricultural Chemistry and Geology"), p. 926; barley 15, oats 16, rye 12, Indian corn 14, rice 13, peas and beans 14 each. The same authority says that twenty samples of English wheaten flour analyzed in his laboratory yielded 15 to 17 per cent. of water (page 867), and that the average per-centage of water in English flour may be set down at 16 per cent. (p. 878). The offal or bran only yields about 12 per cent. of water. Several samples of Austrian flour yielded from 13 to 15 per cent., while flour from Cape wheat only yielded seven per cent. of water. Old wheat gets drier but heavier per bushel, and loses about three per cent. of water in the grinding. Such are some of the results of chemical analysis.

It will readily be seen from the above difference between the per-centages of water contained in samples of wheat from different places, as England, Austria, and the Cape of Good Hope, and from the large quantities of foreign wheat now imported into England from all climates, the per-centage of water in the wheat before it is ground, and the flour and bran, must be very different. Query :

How does the difference in the moisture of the wheat and flour affect the aeration of the grinding surfaces of the millstones? the quantity of steam and heated air in the millstone case? and the quantity of steam and floating stive in the mill?

Although the general answers to these questions are manifest, we are nevertheless apprehensive that the opinionative conclusions commonly arrived at are anything but satisfactory. In point of fact, opinions are not admissiable in the solution of questions in physical science; for the modern rule in all such cases imperatively demands experimental evidence. True in patent infringement law-suits opinionative evidence is still admitted, contrary to the modern rule laid down in all our universities and class-rooms where physical science is taught; but it is, to speak in the mildest terms, high time that all such antiquated one-sided evidence was ordered out of court, and its place supplied by experimental evidence.

If so much of the water in the wheat is converted into steam in the grinding and emitted into the atmosphere, then the flour and bran together must be drier than the wheat by the per-centage of moisture thus given off in the grinding. The theoretical rule appears plain enough, but we have some difficulty in reconciling it with the above chemical analysis, in the laboratories of the late Professor Johnston and other chemists. If, for example, we set off on the one side of the account 15 per cent. of water in the wheat, and on the opposite side 17 per cent. of water in the flour and 13 per cent. in the bran, then to strike a fair balance there must not only be cool grinding and no steam, but moisture absorbed by the flour from the air drawn in at the eye of the runner. Was such the case? If, for example, there was one per cent. more water in the flour and bran together (*i. e.* 16 per cent.) than in the wheat (*i. e.* 15 per cent.), then this one per cent. must have been derived from the atmosphere, consequently as it entered the eye of the runner along with the wheat it belongs to the same side of the account, and so by adding this 1 per cent. to the 15, we have 16 per cent., which makes a fair balance. We repeat the hypotheses, was such the fact?

The atmosphere at times in this country is heavily loaded with vapour, more especially in warm, moist weather in the summer time; and in not a few steam-mills steam escapes inside the mill from the safety valve, &c., while outside the mill the condensed steam keeps the mill in a muggy summer cloud, even in fine, dry, frosty weather, when otherwise the atmosphere is comparatively dry. This steam, muggy state of the atmosphere in steam-mills is more especially felt in confined localities, such as in the metropolis and other large towns, where a disagreeable choking sensation is felt in breathing such an atmosphere. Under such conditions town mills will be "grinding heavy" in dry, frosty weather, when country water-mills and wind-mills will be "grinding lively;" hence the difference.

Flour often does absorb moisture from the atmosphere, and it is possible, considering the small difference that exists between the two sides of the account, that vapour therefore may strike a balance; but there are other hypotheses that may be raised as likely to form the balance, as the absorption of the difference at issue from the atmosphere, and this fact, were there no others, as there are many, is amply sufficient to show the propriety and justness of excluding all opinionative rotiocinations and evidence in the determining of the necessary physical data required in the solution of physical questions in milling.

Millers often moisten their wheat, as has already been shown in No. XIV.; no less for the purpose of obviating "greys" than increasing the weight of the flour. And we aver that modern millers are better informed in this sort of chemistry than were their ancestors in the days of querns, cog-wheels, and trundles. But, be this as it may, the proper application of water to moisten dry wheat has a tendency to keep down temperature, the liberated caloric being carried off in steam. Watering, also, rather facilitates grinding, provided too much is not applied, due attention being paid at the same time to the feeding and velocity of the stones.

Again, if the sample of flour which yielded 17 per cent. of water was produced from wheat containing 16 per cent. of water, then, according to the preceding hypothesis that the flour and bran together yielded 16 per cent. of water, there would be an even balance.

It would be superfluous to carry hypothetical solutions of this kind farther. The above three examples show plainly enough that the facts of the case at issue, or solution of the question sought, can only be determined in the above as in every other example, by experiment, and by experiment alone. In other words, the per-centage of water in the wheat, and also of that in the atmosphere, must be determined by chemical analysis before they enter between the millstones. The sum of these will form the whole per-centage of water on this side of the account. On the other side the per-centage of water in the flour and bran together, including the whole of the stive, deducted from the foregoing, or wheat side, will give the per-centage of steam, if any, that is thrown off to choke the mill-case, and otherwise smother the miller in his mill; and, we need hardly add, that it will take very careful chemical manipulation to arrive at an approximate trustworthy conclusion. Moreover, it must ever be borne in mind that after all this analytical labour has been performed, and the balance fairly struck, it only applies to that individual example, each new or fresh example requiring the determination of its own peculiar physical data by a similar experimental routine in the mill and laboratory.

Water is not the only substance that affects the grinding of wheat and other grain, the proportion of the other proximate principles being also involved; but farther into this view of the subject it will be unnecessary to go under progress in the aeration of the millstones from 1852 to 1865.

The temperature of the wheat and atmosphere before they enter between the stones, and the temperature of the flour and of the confined breath in the millstone-case and mill-eye spout, can be easily ascertained by a thermometer. So can the temperature of the outside surface of the millstones, mill-case, and spout. Innumerable experiments of this kind have been made long ago, and they still continue to be made, but more for private than public information; and, besides, as each experiment is only applicable to its own example, and wanting, too, in many of its details for that purpose, their quotation would mislead millers, and rather darken than illustrate physical truth or the facts of the case required. Trustworthy thermometrical experiments, performed with the view of determining the effects produced by differences of temperature in grinding grain in steam-mills, in water-mills, and in windmills, in various parts of the country, as also in all our large towns, would be of inestimable value to the milling interest, and to the pioneers of progress in the mill at present.

Heat, or caloric, is the cause of steam or heated breath in the millstone-case and mill. The small per-centage of water in the wheat absorbs caloric, and by so doing has its bulk greatly increased, that portion converted into steam being enlarged 1,800 times, according to Mr. Watt's experiments. Its specific gravity thus becomes lighter than that of the atmosphere, so that it floats in it, for the same reason that a cork floats in water. The specific gravity of steam is 0.62349, air being 1.000, or one.

For a similar reason the expansion by heat and grinding of the fine particles of flour and stive makes them float in the atmosphere of the mill, while steam will make the particles of flour float, which otherwise are of greater specific gravity than the atmosphere.

The abstraction of caloric from steam and stive condenses steam and throws down stive in the mill. Thus, when the floating steam and stive come in contact with a current of cold air or a cool surface, the steam is condensed. Hence the paste in the millstone-case, spout, &c., &c. ENGINEER.

AGRICULTURAL GEOLOGY.

WEALDEN CLAY.

Wealden clay gets the name from "Weald"—a Saxon word, meaning a wood or forest; in allusion to the ground now occupied by the clay being formerly over-grown with timber. It is placed as the upper formation of the oolitic series, and is constituted of three groups: the Weald clay, Hastings sand, and the Purbeck beds. The chalk and third sandstone, which overlie the oolite, had been swept away by a vast denudation, and the Wealden beds had afterwards been deposited by a fresh-water agency, as is evinced by the entire absence of marine shells, even of the kinds that are most common in similar depositions. What shells there are have most generally the forms of fresh-water or littoral kinds, and the plants are terrestrial or marshy, and not of marine origin. The remains of animals also indicate the littoral or marshy life of the huge creatures of that period of the globe.

This deposit of clay in the character and aspect varies from a dark tenacious clay to that of a blue or grey calcarious marl of an earthy and friable texture. It contains occasionally layers of argillo-calcareous concretions, replete with shells of a noted shell-fish of rivers. The interior of these is usually filled by a calcareous spar, which admits a slight polish, and the masses are wrought up for ornamental purposes, and known as Petworth marble. The septaria of this clay are composed of a deep red argillaceous ironstone, and, with remains of fishes, occur in layers of two and three feet in thickness in the upper divisions of the clay. The mineral contents appear to be limited to the specks of mica which occur in many of the beds, nodules of iron pyrites, and selenite. The shelly remains which are shown in the marbles are thought to indicate a lacustrine or fresh-water origin, but the evidence is not so very thoroughly satisfactory as to place the matter beyond all doubt. It may be observed that these signs are exhibited by the marbles and not by the clays, and that the best proofs are of a mixed description, containing some kinds of aquatic birds, a fresh-water and marine turtle, a land tortoise, with fish teeth and scales. Hence it may be concluded that marine and fresh-water had by conjoined or successive operations produced this formation.

The Wealden clay occupies the low ground of Kent, Surrey, and Sussex; in the first county forming a valley of five miles in breadth from the Surrey borders to the edge of Romney Marsh, and having a depth of 300 feet. It also occupies the valley running from west to east at the foot of the North Downs, which is watered by the Medway, the Eden, and the Beult. The whole southern border of the county of Surrey is occupied by the Wealden clay, forming the broad valley at the foot of the green-sand hills, and in some places form the lower part of the south side of the hills. In Sussex, the Wealden clay is the next important formation to the chalk. It joins the gault, and extends through the centre of the county, constitutes a low tract of five to seven miles in breadth, and presents no remarkable feature on the surface, except in being favourable to the growth of oak in some places. Much iron was at one time manufactured in Sussex from the ironstone of the argillaceous beds, but the want of fuel removed the operations to districts where coal is abundant. A small portion of the Weald clay occurs in the eastern part of Hampshire. It is wholly unknown in the North of England.

In Dorsetshire, the Weald clay may be traced in the Isle of Purbeck, dividing the green and iron sands, but it thins off to nothing in the western part of that peninsula. In the Isle of Wight it may be observed holding a similar position, and, having obtained a greater thickness, it may be traced following the green sands under the central chalky range, and again underlying the same formation in the southern range of the Undercliffe. The formation never rises into hills of any height. In the central weald of the southern counties, where alone it possesses sufficient thickness and extent to give any character to the general form of the surface, that surface is a uniform broad vale. The depth has been mentioned at 300 feet in in Kent, in the Isle of Wight it appears not to exceed 100 feet. Their elevation appears to be always parallel to the superstrata of green-sand and chalk. The alluminous chalybeate spring of water in the Isle of Wight appears to have its origin in this formation.

The Wealden argillaceous deposit presents to the farmer a soil of pale, cold, and retentive clay, naturally covered with woods, and of a productive quality that is very considerably below mediocrity. The prevailing arable character is a hard aridity and a meagre unctuousness, which denote a great want of mellow ingredients and exuvial mixtures. But the texture freely permits the land being ploughed by the power of two horses, though the winter-furrow is better done by three, and in the depth of seven or eight inches, which affords an ample quantity of soil for the summer operations. Two horses walk in tandem in the furrow, and the third on the unploughed land; and he is a match for the two in the furrow, by having the long end of the main-tree or the steel-yard adopted in use. The other operations in working the land are conveniently done by two horses and the common implements.

Root-crops are not admitted by the Wealden clays, and the process of summer-fallowing is indispensable. Farmyard dung is the only suitable manure; and the young crops of grain may be top-dressed.

The clay is not so wet or so retentive as the plastic and London clays; and the draining may be less frequent, in the distance of eight yards, with the drains slanting in the direction of the ridges at a greater or less angle, as the surface of the ground may direct. In many cases the ridging may be wholly laid aside, and the drains are laid by the fall of the ground. The depth of the drains as before mentioned, and also the filling materials.

The rotations of cropping may be: First year, fallow (dung and lime, in 150 bushels); second year, wheat; third year, clover; fourth year, oats; fifth year, vetches; sixth year, wheat.

The vetches may be of the winter or spring variety, and are consumed by sheep on the ground, which is sown with wheat, from one ploughing. On the weaker clays of all denominations the pasturage system is most earnestly recommended, as tending to give to clay-lands the very thing they want, in the formation of loam by the decay of the roots and leaves of the grass, and by the rest of the lands affording time to assimilate and amalgamate the materials. The decay of vegetable matters yields a manure that surpasses every fertilising substance yet discovered.

The arrangement will be as follows: First year, fallow (dung and lime); second year, wheat; third year, clover; fourth year, pasture; fifth year, pasture; sixth year, oats.

Beans are not an appropriate growth on the Wealden clays, though they may be introduced, on the very best sorts of the land, in the fourth and fifth years of the above rotations; but, as the soil rarely permits a preparation in the spring for the beans, at least of any effect, the crop is in broadcast, and had better be omitted. Peas are not advantageously used, but may be tried on the pasture furrow, in the place of oats. In that case, a crop of oats will follow, and prolong the course into seven years; and beans may be substituted for the peas alternately in the course of cropping, which will give the land the benefit of the leguminous crops, along with the pasturage of the grasses. The system is most admirable.

The list of grass-seeds as under, per acre: Raygrass half-a-bushel, cocksfoot a quarter of a bushel, meadow fescue 4lbs., catstail 4lbs., dogstail 4lbs., hard fescue 2lbs., red clover 8lbs., white clover 4lbs., trefoil 2lbs.

The Wealden clay forms a transition from the marine to the fresh-water formation; and, though it is placed in the oolitic system, it may be held as a posterior formation to the clays that overlie the chalk, which is itself a later deposit than the oolites. As before observed, a denudation had bared the oolite of the superincumbent sandstone and chalk, and afforded the position for the Wealden clay from the agency of fresh-water locations and estuary deposits. It would appear that both these agents had been, jointly or separately, employed in the production of the Wealden argillaceous beds. The fresh-water may have predominated, and given to the three constituents of the group a greater resemblance to the alluvial than to the preceding overruling agents of operation. It is largely accompanied by calcareous matter, which has been continued in diffusion, as seen in the Purbeck beds and in the Petworth and Sussex marbles. The stones are shelly, and thinly laminated, but evince in the various forms and qualities the presence of the substance, and that its matter attended every formation. Sand is also very largely diffused, both in beds and in mixture; and all the materials had descended from the state of schistus or shale to the condition of pulverization, whereby they were all prepared to form the sub-aërial deposit, or the cultivable stratum of the globe.

The average value of the Wealden clay is about 12s. per acre in the ordinary management of the land.

SHALE COAL CLAYS.

Shale coal clays overlie the coal measures in the counties of Northumberland and Durham, of carboniferous notoriety. The colour of the thin stratum is mostly black; the upper and under strata are often similar in a pale red colour, and sometimes whitish, with sands intermixed. The more generally black colour may have proceeded from the shale of the coal, and have inherited from that deposit the inimical quality to vegetation; for the productive powers are very low, even when the clay almost immediately overlies the new red sandstone rock. In many places the depth is small before the coal is reached, and the approach to that deposit finds the shale or undecomposed clay to be black and indurated, and regularly laminated. The cultivable stratum generally lies on beds of dry hardened clay, gravelly or sandy, according as the contiguity is fixed to the diluvial agency, or to the detritus of the sandy rock. Where the rock is upheaved good lands appear in clayey loams, while the surrounding low grounds are occupied by the sterile clays. The soil is very retentive of moisture, and the absorbing stratum being shallow, the management is not a little precarious in the spring and autumn. The total want of shells of any kind, and the absence of organic remains, consign these clays to the agency of fresh water in a tranquil state of operation. There are no contortions or disturbances, nor any visible interruptions of the sedimentary depositions. The formations have been little noticed, as they are not connected or associated with any stratified deposit, as the chalk or oolite, nor are they conducive to the illustration of any superincumbent or surrounding formations. The carboniferous limestone appears on the high boundaries of the concavity of the coal-beds, but seems wholly unconnected with the formation of the soil.

The land very generally bears a near resemblance to the wielden clay: it can be wholly tilled by the power of two horses, and by the common implements, in the plough, harrow, and roll. The winter furrow is best in the depth of 7 or 8 inches, and will require three horses. The texture of the soil excludes any root crops, and the bare summer fallow must be adopted. The quality of the land generally is below the growth of beans, and is not favourable to peas or vetches. Oats are grown, but not advantageously; and wheat, even in the poor returns that are obtained, forms the staple production of these lands. The four-years' course of cropping, viz., 1st year fallow, 2nd wheat, 3rd clover, and 4th oats, has been followed for a length of time, and with much injury to the land; and peas have been introduced in the third year, fourth year oats; thus omitting clover, and using it only once in eight years. No very great benefit has happened from this change; and as beans and peas must be used in broad-cast, the benefit of the half-fallowing cultivation of these plants is not obtained. The pasturage system comes forward into operation with great advantage on these lands; the matting of grassy roots which cover the surface affords a decomposing nutriment to the succeeding crop of oats, and the rest which the land enjoys tends to invigorate the powers of the soil. Thus in five or six years, 1st year fallow, 2nd wheat, 3rd clover, 4th pasture, 5th oats; or, 5th pasture, 6th oats, these lands are wonderfully improved by these courses of cropping, and sheep thrive well on clay lands, provided the herbage be fresh and sweet. This object is attained by the regular renewal of the pasture by fresh seedings of the cultivated ground, if any damage has arisen from old mossy herbage. Vetches, beans, and peas are sown for the use of the farm, but form no part of the beneficial cultivation. Being in broadcast, the tendency is to scourge, and not to improve; hence the use is very limited. The grass-seeds to be used as under: May grass ½ bushel per acre, cockfoot ¼ bushel, meadow fescue 2lbs., cat's-tail 2lbs., dog's-tail 2lbs., red clover 6lbs., white clover 4lbs., trefoil 2lbs.

Farm-yard dung and earthy composts are only useful on these lands with the usual top-dressing on the spring crops. The draining must be frequent in fine lands, the drains being placed in the furrows or slanting the ridges, cut to the usual depth, and filled as before-mentioned for clay soils. In the Midland counties, and around Birmingham, the colour of the clays is more red than of the last-mentioned varieties, and the quality is somewhat better; but the general nature compels the same management in every respect, as the resemblance is very great in the dry aridity of the ploughed soil, and the very repulsive quality to any root crop, or to any leguminous plant. Where they are introduced, the broadcast cultivation rather forbids than recommends them. Being cleaned by fallowing of the weeds of annual and perennial life, that condition is better preserved by the land remaining in grass for two or three years, than by continual cropping, which encourages the germ of life of every denomination to spring into existence. Hence the great benefits that have been derived from this system wherever introduced, and properly performed. Wherever similarly managed, it has been attended with similar results.

The clay lands of South Northumberland in the lower part of the county are wholly of the above description, and also in the county of Durham. Some few turnip soils appear on the high grounds, whence the rock of sandstone rises over the coals, and in the upper parts of the county the geology changes into the mountain limestone and millstone grit, supporting soils of wholly different character. The value of the clay lands is at a very low ebb, the sum of 10s. to 12s. an acre is the average in cases of farms being wholly composed of clay lands. There are clays overlying the sandstone, which are of good character, and produce heavy crops of roots and grasses. But the poor clays prevail in the coal districts, and with little variation of quality. The banks of rivers and brooks exhibit the beds of decomposing shale, dipping at various angles of inclination. The bituminous nature imparts the barren quality to the soil, as it constitutes the superiority of the coals of Northumberland, of which the deposit is covered by a vast depth of alluvial debris, in which the shale forms a constant attendance. The formation is much more entire than in the marine deposits of clays, and is less reduced in the texture. It lies over the coals, and even upon the sandstones.

CRAG.

Crag is a local marine deposit consisting of two parts, one a coarse calcareous zoophytic and shelly rock, the other a loose deposit of sand, pebbles, and shells. It overlies the London clay, and is the nearest bed of the upper marine formation of the tertiary system, to which it belongs by the authority of the best observers. The formation caps the cliffs on both sides of Harwich, and at Walton-Naze in Essex it is exposed on the cliff for 300 paces in length; quarries of it are worked in Suffolk, and near Lowestoft it appears in the cliff, together with sand or red loam, covering the London clay. The diggings show that the formation extends over 40 miles in the counties of Norfolk and Suffolk. The elevation is 50 or 60 feet above the level of the sea, and the bed is about 30 feet thick. The soil which it supports is a very rich loam, and forms the best cultivated districts in England. The shelly mass of the crag itself forms a useful improvement to the poorer sands. Many of the fossils agree with the organic remains of the upper marine formation in the Paris basin. The shells lie very confused, but are well preserved, and patches are found of genever and species huddled together. Oysters and wilks are abundant, and many shells of existing animals.

A large mammoth tooth was found on the beach near Harwich. This formation does not reach beyond the locality that has been mentioned.

BAGSHOT SAND.

This sand overlies the London clay, and belongs to the upper mervine formation of the tertiary system. The bed consists chiefly of siliceous sand and sandstones without any cement, but occasionally includes, or is associated with, brick earth. The sandstones do not form a continuous range, but lie imbedded in the sand, and require blasting by gunpowder, and are used for paving and building. The dried stones of Stonehenge, and of Amesbury, in Wilts, are of this formation, which is sometimes termed "Sarsden stones;" chalk-flints are sometimes imbedded in the stones, and also small, flat pebbles, but no minerals. The organic remains are very imperfect in shells, resembling those of the upper mervine formation of Paris.

The sand forms Bagshot-heath, a part of Windsor-forest, the eminences of Highgate, Hampstead, Hornsey, and some patches in Surrey, at Egham, Guildford, and Kingston-on-Thames. The deposit is very conformable with the London clay underneath, and nearly horizontal. The sterility is almost proverbial in a hungry sand, producing a scanty heath and stunted furze which remain unimproved notwithstanding the vicinity to the metropolis, which possesses the means of almost changing the ordinations of nature in such cases.

GRAVEL.

The word "gravel" comes from "gravier" (French), "graveel" (Dutch), "gravel" (Armoric), and means hard sand, or sand consisting of very small pebble-stones. The sizes of the particles vary from that of a small pea to that of cockles, and larger. They are often intermixed with sand, clay, loam, flints, pebbles, iron ocre, and other mineral bodies.

It is an essential character of gravel that it shall contain rounded "stones," extraneous to the place where they are found, otherwise the decomposition of loosened rocks and strata near the surface will be confounded with it, as has often happened in the description of countries. The earthy matters found in gravel vary in all degrees from clay to sand, and according to the prevailing quantity of these matters, the gravel gets its distinctive name. Thus, to seashore gravel, where the action of the wave hinders any mixture from being retained, the term "clear gravel" is applied; where there is a considerable quantity of clay, we use the name "clayey gravel;" where sand is round, it is called "sandy gravel;" where loam is in quantity, the name of "loamy" is used; and some writers add the term "alluvial" to the above terms of sand, loam, and clay, using it in the strict and proper sense as denoting matters worn, moved, dispersed, mixed, and deposited in water, in distinction from the regular or undisturbed matters of the terrestrial strata, which, though they show evident marks of having been deposited in a fluid, the perfect homogeneity of the lamina of the strata and their vast extension, without rude or accidental mixtures, show that the laws which governed the two kinds of terrestrial deposits were not less distinct and marked than are the processes of the precipitation of matters before mechanically mixed and suspended in a fluid, and the crystallization of substances from menstrua supersaturated therewith. During the deposition of the strata, all was tranquil and quiet, except the movements of animated beings, which occupied successively the vast subaqueous plains of strata: during the formation and deposition of the gravels of every description all was violence and confusion, and apparently so continued for a long period of time.

It is an important problem in geology to settle the point whether gravel is anywhere found under regular and undisturbed strata? Many writers have asserted this to be the case; but Mr. William Smith and others, after a very long and laborious investigation, have come to the conclusion that no such case can be pointed out in England. It is very true that indurated masses occur with some few rounded stony fragments in mixture, which are of difficult discrimination from the form of stratification; but these doubtful masses have been continued in character "downward" to such gravel-beds, and nowhere are any regular strata found upon these doubtful masses, where due caution is used in making and extending the observations. Siliceous or grit-stone beds and rocks have been mistakenly classed with gravels, being composed of distinct grains of silex or crystallized quartz, in various sizes, and mixed and indurated together; but an attentive examination of their beds and accompanying strata, and of the newly-cut or broken faces, and a comparison of them with the heterogeneous mixtures and irregular stratification of the real gravel rocks, as they appear, in beds of immense thickness, in many midland tracts of England, will distinguish the coarsest of the gritstone strata from the superficial mixtures above mentioned, and from alluvial or water-worn mixtures of any kind. A uniform and constant law has regulated the formation of silex, and of coarse as well as fine gritstone, and sufficiently prevents their being confounded with the water-worn gravels. Accumulations of gravel are to be distinguished into native and foreign, according as the pebbles, earth, and extraneous bodies among them can be referred to known and adjacent strata, or consists of stones and earths not elsewhere found, but in very distant countries. Except on the sea-shore, where the gravel is formed by the waves acting upon the fallen cliffs in fragments, the gravel of no spot corresponds with the strata on which it is lodged; and where it does very rarely occur, it will be found that the strata extend to the east or south-east of the place where the gravel is lodged; and this is explainable upon the principle that the general moving of natural alluvia has happened from the south-east to the north-west quarter. The coarse and irregular grit-stone strata occur beneath the carboniferous strata, or coal measures, but do not seem to indicate, as Mr. Kirwan thought, the near approach to the fundamental rock of granite. It is of very great importance to discriminate accurately the alluvia found in different parts of every country, and to trace their connection with the different masses on which they rest, and from whence they have been torn.

Gravel is a diluvial deposit, and therefore older than the alluvial formation. The title "diluvial" implies some very curious and important characteristics. Thick deposits of clay, sand, and pebbles are found at the very summits of hills as abundantly as in the valleys. Fragments of rocks wholly different from those in the vicinity lie in valleys, on hills, and even on islands, as in Staffa. These fragments are found solitary, or buried in clay, sand, and gravel, in enormous abundance, and unlike to any rocks within a hundred miles of them. The largest blocks or boulders lie at the top of the deposition, resting on the sand and smaller gravel. Successive deposition can rarely be traced, the masses being very indiscriminate, large and small bodies, light and heavy, being laid together without any order or arrangement. Amidst such confused masses bones of land quadrupeds, mostly or entirely of extinct species, and even of extinct genera, occur in abundance.

In order to account for these characteristic phenomena, it has been found necessary to suppose great changes of physical geography, or physical processes not seen in daily operation, such as extensive displacements and changes of level of land and sea, unexampled floods of water, surprising alterations of climate, or movements of glaciers in situations where they could not now exist. And one general and overwhelming inundation has been mentioned as being able to overcome the lesser inequalities of the surface level, but modified in its course by the larger ranges of mountains and valleys.

When beds of gravel approach the surface of the earth the mass forms a gravelly bottom: in agricultural language, when they reach the open daylight a gravelly soil is formed, and when the size of the stony particles exceeds the size of a hen's egg the land is called "stony." Pure gravelly soils have generally a substratum of the same material, more gritty and indurated, and wanting in the mixture of animal matters which the upper stratum has derived. When it rests upon clay it forms a weeping soil of very poor quality. But the poor gravels are in many instances very fertile, the open texture admits moisture very freely, and the under soil being duly compact retains it in due quantity, and gives it out as wanted for vegetation. In some cases both the upper and under soil are too loose and open, yield the moisture too freely, and in dry seasons the crops are scorched. Sound gravelly soils are very favourable [for turnips: the pebbles retain a very agreeable coolness in hot weather, and afford a shelter to the rootlets during violent heats. The lands also produce good barley. Like most soils, the quality of gravelly lands depends on several contingent circumstances—the quality of the substratum and the openness or compactness, and on the quantity and quality of the vegetable and animal remains which have lived and died on the surface of the ground, and also upon the way or mode in which the different materials are chemically combined. When immoderately mixed with clay, a soil is formed that becomes very difficult of tillage, and also of drainage, from the water having many oozings and filtrations, as beds of sand or of mixed sands most generally underlie the beds of clay and gravel. The pebbly stones get very firmly imbedded in the clay during dry weather, and offer a very tedious resistance to the action of the agricultural implements, and, as may be very readily supposed, the stony soil is very grating for the iron part of the implements that moves below ground, especially when the under-soil is formed by a bed of indurated dry clay in which are very firmly imbedded great quantities of pebbly stones of various sizes. The bed or matrix in which the conglomeration is fixed, and on which the stratum of soil is reclined, forms the chief consideration of gravelly lands, more so than in most other cases of soil and subsoil.

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of this society was held at Taunton, on Tuesday, March 5, under the presidency of John Tremayne, Esq. There were also present: Messrs. R. G. Badcock, R. Bremridge, R. Brent, M.D., R. H. Bush, J. H. Cotterell, T. Danger, M. Farrant, H. Fookes, John Gray, Jonathan Gray, J. D. Hancock, W. R. Hicks, T. Hussey, J. E. Knollys, H. St. John Maule, Rev. T. Phillpotts, Messrs. S. Pitman, J. P. Pitts, J. C. Moore Stevens, E. U. Vidal, E. B. Willyams, H. Spackman (official superintendent), and J. Goodwin (secretary and editor).

THE APPROACHING SALISBURY MEETING.—The secretary having read a letter from the right worshipful the mayor of Salisbury, announcing that as yet there is no authorization to re-open the cattle market, it was moved by the Rev. T. Phillpotts, and resolved, "That a deputation consisting of the President, Sir J. T. B. Duckworth, Bart., Mr. Acland, M.P., Mr. Walrond, M.P., Mr. Neville Grenville, M.P., and the Rev. T. Phillpotts, be requested to apply to the Lord President of the Council for authority to hold a meeting for the exhibition of stock in the week commencing the 10th of June, and that the mayor of Salisbury be requested to co-operate in the application."

THE OPENING DAY OF THE SALISBURY MEETING.—A committee, appointed by the council to consider and report on the best means for rendering the opening day of the Salisbury Meeting more popular and attractive, reported that they met at Amery's Christopher Hotel, Bath, on Friday, February 8th: Present—Mr. Knollys, in the chair; Mr. W. Thompson (mayor of Bath), Messrs. Jonathan Gray, Henry Fookes, R. Brent, M.D., S. Pitman, James Hole, and John Gray, and that they unanimously recommend :—

1. That that the resolution passed by the council at their last meeting, on the 29th January, "to invite the mayor of Salisbury to open the Salisbury Exhibition on Monday, June 10th, accompanied by the town council, the honorary local secretary, and the acting local committee," be communicated to his worship and his colleagues without delay.

2. That Salisbury being the residence of the diocesan, and a cathedral city, the bishop, the dean, and the other cathedral dignitaries should also be invited to the opening.

3. That an invitation be also sent to the members of the county of Wilts and to the members for the city of Salisbury.

4. That the admission to the yard of those invited to take part in the opening ceremony should be fixed for one o'clock punctually; and that in order to ensure a fitting reception for those invited, the president of the society and such vice-presidents and governors as may be at Salisbury, together with the stewards and officers of the society, should assemble in front of the offices at least ten minutes before the time of opening. That the company be admittted into the yard by any private door sanctioned by the Financial Committee, and that such door be at once closed after the last invited guest has passed through.

5. That one hour be allowed for the visitors to walk round the various departments.

6. That a cold luncheon be provided at two o'clock, in such tent as the stewards' arrangements may determine; that at such luncheon accommodation be provided for ladies; that the addresses in relation to the opening of the Exhibition be made in this tent immediately after the luncheon is concluded, and that the reporters for the public press be admitted to the luncheon on the same terms as they formerly were to the annual dinner.

7. That subject to the above exception in favour of the press, no charge be made on the Society's funds for luncheon tickets.

8. That the contractor for the Show-yard refreshments be required to provide the luncheon on the terms named in condition 3 of the refreshment contract, by which cold luncheon is to be provided at a charge of 2s. 6d. for each person, exclusive of liquors.

9. That the particulars of the opening ceremony, together with the charge for luncheon, be inserted in the programme of the week's proceedings.

10. That the field stewards, Mr. Knollys. and Mr. Jones, be requesed to assist the steward of the mess (Mr. Henry St. John Maule) in carrying out the arrangements requisite for the luncheon, and for the reception and accommodation of lady visitors.

11. That the stewards of horticulture and music be requested to make arrangements for the opening of the Horticultural tent, and for the attendance of a band of music in the yard by one o'clock, on the opening day of the Exhibition.

This report was unanimously adopted.

On the motion of Mr. Cotterell, a committee, consisting of Mr. Knollys, Mr. Badcock, Mr. Cotterell, Mr. Moysey, Mr. Poole, Mr. Acland, M.P., Dr. Scott, the Rev. T. Phillpotts, Mr. Hicks, Mr. Rawlence, and Mr. Pain, was appointed to co-operate with the Salisbury Local Committee, in considering how the objects of the Society may be promoted during the week of the Show by the reading of papers, the giving of lectures, conversazioni, &c. The committee subsequently met, and the chairman (Mr. Cotterrell) was directed to communicate with the local authorities at Salisbury, with the view of arranging for an evening meeting or conversazione, on Wednesday or Thursday evening, at which information on local agricultural and other kindred subjects may be afforded. It was also directed that enquiry be made as to whether an excursion can be arranged to any object of agricultural interest in the vicinity, during the week of the Show.

NEW GOVERNOR.—Mr. Henry Duncan Skrine, Warleigh, Bath.

NEW MEMBERS.—The Hon. and Rev. J. Townshend Boscawen, Larnorran, Probus, Cornwall; Rev. C. Caker, Telsford; Mr. Samuel Hayward, Bath; Mr. Thomas Compton, Fisherton de la Mere, Heytesbury; Messrs. Tuck and Sons, Market-place, Bath; Mr. Richard Wippell, Rudway, Thorverton, Devon.

THE ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The monthly meeting of the Council of this Society was held at 42, Upper Sackville-street, on Thursday, Feb. 28.

Present: Sir George Hodson, Bart., in the chair; The Hon. Harman King Harman, Sir Percy Nugent, Bart; Hans H. Woods, Leopold Cust, Denis Kirwan, William Donnelly, C.B.; M. O'Reilly Dease, Philip Jocelyn Newton, Phineas Riall, P. M'Evoy Gartlan, Charles Colthurst Vesey, Leonard Dobbyn, L. Waldron, J. M. Royse, R. M. Carden, Alexander E. M'Clintock, E. Purdon, and Major Borrowes.

The chairman brought up the following report from the finance committee:—

"At the meeting of the finance committee, held on the 16th day of November, 1865, it was resolved that a sum not exceeding £800 should be offered in prizes at the annual show of the society, then intended to have been held in Dublin in 1866. The amount offered at the Sligo show, in 1864, and at the Clonmel show, in 1865, was £700. The committee think that, the funds of the society being somewhat improved since that period, and it being expected that the show of 1867 will be unusually large, it would be advisable to increase the sum; and they recommend that £1,000 should be offered in prizes, out of the funds of this society, at the show intended to be held in Dublin this year."

Captain Thornhill stated that that was £500, in addition to the £500 given by the local committee.

Mr. Cust inquired how much did they usually give to the shows?

Captain Thornhill replied that it was £250 more than they usually gave.

Mr. Donnelly wished to know what funds they had in hands?

Mr. Woods said, on looking at the book, he found they had a sum of £946 at their disposal.

Mr. M'Evoy Gartlan: There are also this year's subscriptions, which are intact.

The report was confirmed.

The Chairman stated that, after the last meeting of the council, directions were given to the secretary to draw up a new guarantee in reference to the expenses to be incurred in holding the next annual show of the society, in place of the one prepared last year. That had been done; and he then held in his hand the guarantee in question, which had been signed by the Lord Mayor, Alderman Mackey, Mr. John Barrington, T.C., and Mr. Edward Purdon, T.C.

The accompanying letter was received from the Under-Secretary:

"Dublin Castle, 8th February, 1867.

"Gentlemen,—I am desired by the Lord-Lieutenant to acquaint you, for the information of the Joint Flax Committee of the Royal Dublin and Royal Agricultural Societies, that a communication has been received from the Lords Commissioners of her Majesty's Treasury, stating that their lordships are pleased to approve of a grant being proposed to Parliament of £2,000, to be expended under the joint direction of the Royal Agricultural and Royal Dublin Societies, as heretofore, in encouraging the growth of flax in Ireland.

"I am, gentlemen, your obedient servant,
"(Signed) T. A. Larcom.

"To the Secretaries of Royal Agricultural and
Royal Dublin Societies."

Mr. Woods asked the secretary if he thought the former grants had effceted any good in the country.

Captain Thornhill replied that they certainly had done some good in some places. The people were becoming acquainted with the proper and most improved mode of cultivating and scutching flax.

The Chairman submitted the following correspondence from the Athy Farmers' Club and the Queen's County Agricultural Society, suggesting the propriety of having a steam-ploughing match at the forthcoming show of the society:

"Athy Farmers' Club, Feb. 8, 1867.

"My dear Sir,—Will you please have the enclosed resolution of the Athy Farmers' Club read at the next meeting of the council of the Royal Agricultural Society of Ireland?—Yours, very truly, "Richard W. Bagot, Hon. Secretary.

"To the Secretary of the Royal Agricultural Society."

"Proposed by Mr. W. R. Bower, seconded by Mr. S. McCullagh, and carried unanimously:

"Resolved,—That the council of the Royal Agricultural Society of Ireland be respectfully requested to take into consideration the propriety of holding a competition of steam ploughs in connection with their annual show this year in Dublin, instead of a horse-ploughing match, which they now have under consideration."

"At the annual meeting of the Queen's County Agricultural Society, held in Maryborough, on Monday, Feb. 24th, 1867, the following resolution, proposed by Mr. S. MacCulloch, Bellegrove Farm, and seconded by Mr. Lyons, Moyanna, was unanimously adopted:

"That, in the opinion of this society, it is advisable to use energetic efforts to introduce steam cultivation into Ireland; and with that view, that a strong representation be made to the Royal Agricultural Society, to urge upon them the importance of offering to English manufacturers sufficient inducements to exhibit their systems at work during the ensuing show in Dublin."

Mr. Gartlan wished to know why not have a steam, as well as horse-ploughing match?

Mr. Cust said it might be in addition.

Mr. Gartlan said there was a general expectation that they would have a horse-ploughing match.

The Chairman explained that they were in this position—that they had an offer from the Messrs. Howard (implement manufacturers), stating that they were willing to send their machinery here, with a working staff, if the carriage was paid. That offer had been accepted by the local committee, who were at that moment in communication with the firm on the subject. That should be stated in reply to the letter from the Athy Farmers' Club.

Mr. Gartlan: State that it is not instead of the horse-ploughing match, but in addition.

The Chairman stated that the accompanying letter had been received from the Royal Dublin Society:

"Royal Dublin Society, Kildare-street, Feb. 18, 1867.

Dear Sir,—The Council of this Society, having been informed that it had been referred to the Council of the Royal Agricultural Society of Ireland to make arrangements for a representation of Irish cattle and agricultural produce at the forthcoming Paris Exhibition, have directed me to request that you will be so good as to inform them of the steps that have been taken with that object, and how far they may be considered likely to accomplish the end in view. I am, dear sir, yours truly, "Wm. Edw. Steele, Assistant Sec."

"Captain Thornhill, Secretary Royal Agricultural Society, Sackville-street."

Captain Thornhill observed that in the wording of the articles it was said that cattle from the Channel Islands would not be accepted, and the communication had reference simply to implements.

The following resolution, adopted by the local committee, was brought before the Council:—

"That, as at present advised, the committee consider the last week of August the most convenient time to fix upon for the holding of the Show."

The following noblemen and gentlemen have entered plans to compete for prizes offered by the Society for improved labourers' dwellings:—Lord Middleton, Munster; Mr. J. D.

Meldon, and the Earl of Clancarty, Connaught; Lord Digby and Mrs. Bomford, Leinster.

The competitors who have intimated their intention of competing for the Hall Drainage Challenge Cup are—Lord Digby and Mr. Vaughan, of Golden Grove.

The following gentlemen were appointed a flax committee for the ensuing year:—Col. Knox Gore, General Hall, C. B., Denis Kirwan, H. J. MacFarlane, Joseph Kincaid, Hon. C. J. Trench, J. Ross Mahon, Charles C. Vesey, Hans H. Woods, John Borthwick, C. U. Townsend, H. O. Saunders, F. La Touche.

The following new members were balloted for and unanimously elected:—Michael M'Namara, Clonmoney House, Bunratty; J. L. Blood, Mountjoy-square; William Ledwith Bole, Park Place, Tashinny; Edward Caraher, Talbot-street; Joseph R. Kerns, Rathgar-road; and Lieutenant-Colonel F. D. Grey, Great Connell House, Newbridge.

THE PEA CROP, AND ITS CULTURE.

The growth of the pea crop has of late years become quite popular, particularly in the district from which I write. A few years ago the bean crop was much more cultivated, and peas were adopted as an intervening crop. Now, it is *vice versâ*. I am not quite sure this is right, as very many are the disappointments experienced in the growth of peas. Their slow progress in the spring gives the weeds an advantage: the various attacks of "fly," of slug, of aphis, of mildew, combine to render a good crop very uncertain. At harvest-time, the crop is a difficult one to make safe: continual rains destroy the haulm. The little grubs of innumerable beetles attack the pea itself, and soon eat the contents of the shell; and, unless continually turned, in wet weather, their contiguity to the ground soon causes them to vegetate. On the contrary, if the haulm is well got and the crop is satisfactorily grown, it is a very valuable crop, and, as a change in rotation, well worthy of adoption—*i. e.*, to have alternate crops of peas and beans, as the year for a pulse crop returns. The bean-plant roots will penetrate further down, in search of food, than the pea-plant: hence the utility of the change.

The soils best adapted for the growth of peas are the rather stiff loams or loamy clays. Beans grow well upon very stiff clays; but peas require a freer soil. The alternative is, to aim at making heavy soils more like free loams by management, and thus make provision for a good pea crop. Almost any soil, under good culture, will bring a crop of peas, providing attention is paid to the almost innumerable varieties under culture, the great thing being to procure the special variety suited to a given soil. For poor soils or soils low in condition, by all means, seek out a free-growing and rather long-strawed, prolific kind—*i. e.*, Prussian Blue, Painted Lady, Partridge Grey, Large White, Marrowfat, Imperial Blue, Prussian White, Sangster's White, and many local varieties and names. For richer soils adopt the short-strawed varieties, which are very many—Fan-tailed Marrow, Magnum Bonum White, British Hero, Short-strawed White, Short-strawed Blue, and many others of local name.

It is excellent practice to manure the land at the rate of ten cart-loads per acre: it is not lost on the succeeding wheat crop, and conduces greatly to an abundant crop of peas. Artificial manures do much good, if properly harrowed-in. Peruvian guano, not exceeding 2½ cwt. per acre, causes a large increase in haulm, and generally adds much to the yield. All this depends upon the fertility of the land. If it is already in truly good heart, no manure is really requisite; and if an early variety is sown, they will come so early to harvest that a good bastard-fallow may be obtained, and not unfrequently an excellent crop of rape or stubble-turnips; or, if desirable to sow the land with any of these crops, to stand for seed, it is an excellent preparation, and does not often prove a failure. In some potato-growing districts this "pea-land" undergoes an autumn-fallow, and is laid up for early planting of potatoes in the ensuing spring.

Many farmers are in the habit of growing peas under contract, for wholesale seedsmen. This is a very speculative business. High prices are often given; but in most of these cases the sort to be grown is not prolific, or there is unusual difficulty in obtaining a plant or a succeeding profitable crop. Frequently they produce very little haulm: consequently, the weeds have full scope. Many of these contract varieties are exceedingly valuable for garden-growth or table-service, but most unprofitable as field-peas. I have, however, grown some of these scarce varieties, with haulm from four to seven feet in length; but the pods were very thinly set, and the crop not worth culture. Contractors ought to know well the kind and character of growth and the probability of yield before they sign the contract. Seedsmen of course know pretty nearly the habits of growth and likelihood of produce of every variety they send out. With farmers nearly all is speculation. My advice is to avoid these contract temptations, unless aware of the sort and its habits of growth, &c., &c.; and if the sort is not tolerably pure, much loss accrues from roguing, as it is termed—taking out all strange flowers. This business is, however, altogether another thing, when a farmer does for a course of years engage with his seedsmen to grow crops for him. Then a mutual understanding makes all right; both parties aid each other. No danger then of unprofitable sorts or stinted prices. It is a mutual and beneficial accommodation to both contractors. I name this matter of contract growing feelingly, having been severely bitten more than once in this way of business. In one instance I received for *seed* a lot of old peas of a choice sort, greatly out of condition, under the assurance that I might sow them without doubt of failure. I was foolish enough to do so. I sowed them extra thick, but it proved a woful failure. I by no means intend to insinuate that wholesale seedsmen act disreputably; but they have the advantage of knowing the probable yields of all the varieties they require contracts for, and they make the best bargains they can with the growers. I only advise growers to beware.

Respecting the preparation of the land and mode of putting in the seed, much need not be said. The land should be well harrowed to a considerable depth for the seed-bed, and be rendered tolerably fine. It is customary in the district from whence I write to commence ploughing the land for peas about the latter end of January, or beginning of February, depending upon the amount of moisture. On no account is it ploughed in a wet state. The ploughing is from five to seven inches in depth, and if a slight frost comes over it, all the better—it works more freely. If the weather is open and fine, sowing will commence about the middle of February, and continue throughout the early spring, according to circumstances—the very early varieties taking precedence. The usual mode of putting in the seed is by drill, and the width of rows very various. The majority of growers prefer the rows to be about ten inches apart. Some contend the width should equal those sown for plucking green—*i. e.*, about 24 inches in double rows, so as to permit cultivation between the wide spaces. This latter mode enhances cleanliness, but the yield is less certain. Every grower ought to know the peculiar character of the variety he is about to sow, the degree of fertility of his land, and adopt his management accordingly. A short-strawed variety will be best and most prolific in narrow rows, and a long-strawed coarse-growing sort will be best in comparatively wide rows. All early-sown crops must be well tended, or woe to the seed-bed. Rooks and pigeons are desperate rogues to early peas.

Much controversy occasionally arises as to the proper quantity for a good seeding. This should mainly depend upon the fertility and free working of the land, and the size of the pea. Small peas need not be sown so thickly as large ones on a good soil. It is customary in this district to sow from 12 to 16 pecks of small peas, and invariably 16 pecks of large ones, per acre, and we never see them too thickly planted in the spring following. In fact, from the coldness of the weather at this season, the growth is very slow, and the slug and other enemies commence their attacks even before they appear above-ground; and, when they do appear, the cold winds and occasional sharp frosts of March do much damage; so that I do not hesitate to say by all means give the soil a liberal seeding. The subsequent management is very simple. Roll them lightly down when about four inches in height, and hoe and weed as often as desirable: no danger of doing too much in either way in the early stages of growth. Every hoeing quickens growth and keeps the crop prospering. A good healthy crop is less liable to the attacks of aphis than a sickly, diseased plant.

P. F.

THE NEW FARM.

My bailiff and an assistant labourer have been busy the live-long day in renewing the pile of heaped-up brushwood beside the pool, where our pet wild-ducks make their nests every year; and I am glad to say that the dear, grateful little creatures show an evident and admiring appreciation of the service. There have been a series of graceful minuets upon the water, the sober-tinted matron bowing coyly to her mate, who bowed again. One or two, moreover, I have seen, attended clearly by fond swain, affectedly inspecting the interior of the dead-leaf-carpeted recesses between the twisted tree-trunks that were laid to keep the mass of superincumbent hedge-clippings from pressing quite to the ground—inspecting, as engaged young ladies might a block of houses, with an earnest quasi-business air that they believe to be profoundly effective, but the main issue of which is not that they succeed in attaining any great bargain over shrewd landlord or demure landlady, but that they impress the future spouse with their exceeding power of connubial economical management.

I am quite longing for the arrival again of the delicious spring mornings, when we shall see once more the lively little black broods sailing after their proud parents right down into the jaws of the narrow channel, where we shall whip them out with a landing-net, to be brought up by a foster-mother within doors; their mamma proceeding, after a few days' widowhood, and sundry excited splashing gyrations, to refit her downy nest amidst the thorns.

Our impertinent friend, the fox, is so persevering in his visits to the homestead that we shall have to chain a terrior close beside this settlement, and only hope that Reynard may not come to appreciate the exact value of the chain, and so despoil us after all.

By the way, there has been another fox brought to grief the last week amidst the crags across the river—a human fox, whose incessant and omnivorous depredations have for some time annoyed the neighbourhood, successfully baffling discovery. His habitation was a small cottage, pitched under shelter of a long beetling range of picturesque inaccessible rocks, with the boiling river just below, and with no ferry but their own boat for a long distance. The consequence was that their family were at once aware of any alarm, and had time to make things safe. However, it came about last week that his master, a neighbouring farmer, who had long been wearied by the continual mysterious disappearance of multifarious articles, boiled fairly overon finding a fat sheep missing from his fold. Suspicion pointed, and the police managed with difficulty to circumvent the stronghold, where they found, not the lost mutton, but two whole cartloads of stolen property—wool, wheat, tools, oats, barley, sacks, &c.—a hoard that must have been accumulating for months, if not years. We ourselves lost last year, during the hay harvest, when all hands were busy at a distance, a mountain wether and a ewe that were fattening for home consumption on the field just opposite this depredator's den, to which at the time we vainly sought a clue. That hill-side, so lovely in the sight of the tourist, with its hanging, ivied, castellated rocks, where the jackdaw and the hawk tribe haunt, its soft brown beech coppice and nut covert, is unhappily dotted over with the small freehold cottages and garden plots of "squatters," a most lawless set, that are the terror of all respectable people within reach.

These "forest" fellows are up to anything, from banding to poach pheasants, to burning down the buildings of any gentleman who may object and dare to convict them. Only this afternoon I observed in the distance an old fellow in a smock, sitting on a rail where he should not have been, and not sleeping very sound either. I at once took up my glass and read distinctly off every lineament of his precious countenance, as it changed under the evident quick workings of a not over-comfortable conscience. At last, clearly deeming it to be all serene, he slipped stealthily off, and along under cover of a hedge between him and the house, stopping ever and anon as if to examine a snare. Ourselves, we slip down too upon the lawn and along an orchard slope and through the chesnut avenue until we attain a hollow beech tree, within which escreened we direct our glass upon his movements at easy rifle-range. I would not have had his feelings for something, so guiltily restless were his glance and movements. At last we fancy we can distinctly observe him setting a snare in our fence, although he stands upon a neighbour's ground. No—he has been watching someone on tip-toe. Now what does he? he is busy twisting a hazel rod with an astonishing amount of handiness and exertion for so old a craftsman. Then he steals on—Ha, ha! we see; and we are out of our sentry-box and across the meadow before he turns, to be aghast: just caught in time before he could commit himself by appropriating a load of newly-stacked cord-wood beside some trees that have been felled. I didn't envy him his feelings on the occasion, nor did I spare my threats, to his infinite consternation. "By goby! him be cotched well," observed our plethoric friend the gardener, in confidence to the missus; "him's not a going to be searching maister's ground again in a hurry."

This reminds me of a clever mode of arresting three poachers single-handed, which I learnt from an old friend, a distinguished county chief constable, a sportsman also of the first water, to whose harriers I used to whip-in as a lad in the holidays, on those wild North Welsh darling hills, with their miles of turf-gallop, interrupted only by just jolly low stone walls and dykes—now, alas! being gradually enclosed for cultivation. At once seize the nearest, and handcuff him around a sapling. The others will run—catch the first, slit down his trousers before and behind with your knife, and cut up his braces; then make after the third, whom, if reached, handcuff also to embrace a sapling oak. You may then readily get up with the owner of the disabled raiment, because you will find he cannot run fast holding up his things, and he is averse, as much to meeting the briars *sans culottes*, as on the other hand he is too much attached to his vestments to leave them behind; lead him off to a safe place, with or without admonition by the way, as your taste and judgment may direct, and return with help to release and secure the other pair.

Well, our young French scholar has been trying it on again. All conversation in English during meals being prohibited to the boy, under a fine, there was distress one day on the appearance of a novel pudding, upon which cook had tried her 'prentice hand, and upon the ingredients of which of course they must needs speculate. "*Du fromage*," remarks one; "*Et du beurre*," interjects another; "*Et du sucre—et du lait*," adds quickly a third; "*Avec toute suite*," with philosophic gravity chimes in our juvenile: which phrase, upon his being called upon to explain, he interpreted to mean "with preserves." Having that morning heard "*toute de suite*" in the schoolroom, from native predilection he had straightway translated it to mean "all sorts of sweets;" and being hard up for the appropriate rendering of *jam*, he gave his generic idea of it in what he conceived to be unimpeachable Parisian. A fair equivalent for which I remember a friend of mine at Oxford, who was fonder of his hounds at home than the pursuit of classic lore in the University, inventing, when hard up in the school for the Latin of *pan*. "*In re aliquâ*" he bravely wrote, with more self-congratulation than clearness of meaning.

But to return from literature to the purely agricultural. I am determined to breed no more horses—at least until Mr. F. Buckland can persuade the nation to partake of horse-steak; in which case I expect there would be more horses bred, and so a better field for selection; when the screws could be made into soup, to which no suspicion could attach, as does to the dark details of the Mugby Junction mixture. At present it is too much of a lottery. You don't know what you may get; and when you do get a nice one, it either dies of unjustifiable inflammation, or, as did a good four-year-old of mine lately, jumps too pluckily at a monster fence, slips on the frozen bank, comes down with his eye upon a hedge-stake, and is brought home literally at half-price. Heigh-ho for horseflesh! Writing of Mr. Buckland, I wonder he does not give us, in his amusing paper *Land and Water*, a description of his swallowing a young frog, to which experiment he was induced by seeing some rustic Arabs do it by the village pool. The moments preceding execution I remember his describing as being so fearfully long. "I thought he'd (from his position on the Professor's lingual ornament) never jump," was his description of his uncoveted experience.

This fine weather has enabled us to get the oats sown in good season, as the expression is. We only hope that the price of this cereal may continue at its present elevated pitch. Our difficult rough side-lands may then give us a fair return for what their tedious cultivation costs.

There is a noisy conclave among the rooks this morning. The resolutions before the house must be interesting. They have been wheeling in the air for some time, filing off in the far distance until quite undiscernible by the naked eye; then coming back in shoals, full drive, before you could turn about or whistle, to settle down, thick as currants in a Christmas-pudding, upon the tall beech-trees right opposite my neighbour's fallow, who marches about, gun in hand, in evident apprehension, behind the drill that is depositing wheat, not a whit grateful for all the good they did him, picking up the larvæ, while the ground was being ploughed, but only anxious to pot them vengefully, wholesale, now; of which beneficent intention they are, however, sufficiently aware; and so they look on listlessly during the pauses of their debate, ever and anon, with a sweep, uprising, should he discharge his weapon, again to wheel, advance, retire, as though

> "Forming swiftly in the ranks of war."

To-morrow, at sunrise, my good friend, shall be the retributive foray. Now, they will not spare you, as they might have done had your ingratitude been less transparent. Have your supper light, then: let your night-cap orders be:

> "You must wake, and call me early; call me early, shepherd dear!
> To-morrow 'll be the plaguiest time of all the glad new year."

Shall we, or shall we not? that is the question. Well, the fact is, there has occurred another great invasion of moles, not a whit the less, apparently, for the subtraction of the lot we paid some coppers a head, last spring, to see strung upon a willow-wand. I very much doubt whether we shall take any measures against them at all, this season. Their runs are certainly detrimental to the light-soil meadows hereabouts; but, on the other hand, you cannot kick over one of their mounds without finding, within, the crustaceous *débris* of many a mischievous grub.

What a number of Shorthorn sales appear on the horizon! Whatever will the upshot be? what the average of Mr. Bett's herd, or the Marquis of Exeter's celebrated stock? Shall the furious fighting of Towneley be repeated? or the determined, earnest bidding, as under the pouring rain at Fawsley? Certain it is that the fountain-heads of the purest blood must be kept untainted, wherefrom to replenish and repair the weaker springs and compound mixtures of the ordinary farmyard herd. Yes; and there is chivalry in England to do it. The purest high-born families of the Shorthorn are now as interesting and valuable as most blood-horse stock; while the love of them is as deeply ingrained in the hearts of their many agricultural and aristocratic admirers as is the love of cricket in the affections of the English nation at large. Shortly, we shall see. It is a turning-point in the tide of pedigree-herds, of which we anticipate a golden issue.

VIGIL.

POTATO FARMING.

Sir,—I never plant less than fifty acres of potatoes, and I will first endeavour to show that the manner in which "A Practical Farmer" advises the land to be prepared for potatoes is almost certain to throw it out of condition; secondly, that the manner in which he says the manure is best to be used is not at all the proper way in which to use it; and lastly, that his description of "the best mode of planting" is so complex as scarcely to be understood, and, if I understand, it is simply childish. First, "A Practical Farmer" says: "All these stiffer and strong loamy soils should be trenched up in the early winter, *i. e.*, they should be broken up immediately after harvest, and in suitable weather after wheat seeding they may be ploughed into trenches or ridges. In this state the soil receives all the ameliorating influences of the atmosphere, frosts, &c." So far very good; but then follows, "And in the early spring they must be broken down by large harrows or scarifiers, so as to leave the soil open or rough till near the time of planting. As this time approaches it should receive all the requisite harrowings and pulverization necessary. If this is carefully and patiently done, it will not require any additional ploughings." Now every farmer must know that unless the land was intended to be ploughed again, the ridges ought not to be touched until the time of planting; for so soon as the harrow comes upon frosted mould, it is no longer "open or rough," but close and smooth, and, after rain has fallen upon it, will run together, lose much of the benefit received from frost, and require again ploughing. Secondly, "Practical Farmer" says: "The foldyard manure, then, is to be the staple commodity for the potato crop; to be used fresh from the yard is best." Now, in leading manure from the yard, is not the top of the yard, even after removing the straw, light and dry, and the bottom heavy and wet? Is not a great deal of it far too long, a great deal of it too much compressed, to spread regularly in the rows? Is it not far better to lead on to a heap until it attains a nice warmth, then turn the whole together, making one quality, and that quality better than any of it would be fresh from the yard, and the manure could then be spread evenly without trouble? Lastly, "A Practical Farmer" says: "The most preferable course, then, is to plant the sets upon the ridge system, *i. e.*, first to set out about nine to eleven rows or ridges with the plough, at a moderate depth; then have carts loaded in readiness, and as quickly as possible manure three ridges, spreading it carefully between them—(just imagine manure from the yard of all lengths, and all qualities, to be spread carefully between the rows!)—then sow from a hopper or basket the artificial manure, to be used down the hollow between the first two ridges, and immediately plant the sets along it by a number of plantmen to keep all going. As soon as the ridge is planted, the plough is ready to commence covering them, by turning the ridge upon them, and so closing one ridge up, and opening another: each planter must have an alloted length to plant." I understand "A Practical Farmer" to mean, a number of men are placed in the same row; but surely I am mistaken. And the term, "and so closing one row up and opening another" would cause any one requiring this wonderful explanation to imagine the opening another row to be planted, when it is only an opening left between two rows. But why talk of each planter having an allotted length to plant? And whatever cause is there for this astonishing haste? If any intelligent farm-servant in this neighbourhood were asked to explain the routine of potato-planting, he would at once say, We work the land well after harvest, and plough it up early in winter a good depth, with a good wide furrow, and never touch it again until the time for planting, when we cross the last ploughings by harrowings and rowings. The afternoon before beginning to plant, a youth takes a strong harrow, and goes a few "bouts," merely that the man about to row may have a starting-place. At six the first morning the youth goes and harrows land for the day, say 3½ acres, a ploughman following and rowing the land for planting; four men, with carts, manuring the rows after him from a heap in the field. At eight the women come to work. We have six women; one, or sometimes two of them, helping the foreman (who looks after everything) to right the manure in the rows; the others each taking a row, and planting potatoes from end to end of the field. As soon as the manure has been righted in a few rows, one or two men begin to sow artificial manure with both hands; each man sows a row on his right hand and another on his left, leaving the row he walks in unsown: in returning, he walks in one of the rows already sown, and with one hand sows the row wherein he last walked, and with the other a row outwardly, and so on. There is not the slightest necessity ever to have the planters near the man rowing; neither is there necessity to put more than one planter in a row. The number of planters should be just to overtake the men manuring the rows before night. The men harrowing and rowing should leave off when they have done so much as the men can manure, and may then help the man to "hap;" thus beginning every morning and finishing every night. If ever these people are in each other's way, it is for want of a practical farmer.

I am, Sir, yours respectfully,

Barlow Grange, Selby, J. Watson.
Feb. 28, 1867.

MALT.—The quantity of malt made in the United Kingdom last year—that is, in the twelve months ending Dec. 31, 1866—was utterly unprecedented. In England and Wales the quantity charged with duty was 47,263,666 bushels, against 44,168,629 bushels in 1865, and 43,975,529 bushels in 1864; in Scotland 2,554,288 bushels, against 2,362,908 bushels and 2,017,244 bushels; and in Ireland 2,463,269 bushels, against 2,414,960 bushels and 2,551,352 bushels; making a total for the United Kingdom of 52,281,223 bushels charged with duty last year, against 48,946,497 bushels in 1865, and 48,544,125 bushels in 1864. Further, malt was made free of duty for distillation and export (the production taking place principally in Scotland) to the extent of 4,335,969 bushels last year, as compared with 4,661,287 bushels in 1865, and 4,837,742 bushels in 1864. The production made duty free for cattle-feeding purposes fell last year to 12,131 bushels, as compared with 55,321 bushels in 1865. The total production of malt charged with duty or made duty free in the United Kingdom thus amounted last year to 56,629,323 bushels, as compared with 53,663,105 bushels in 1865, 53,381,867 bushels in 1864, 50,949,671 bushels in 1863, 45,188,055 bushels in 1862, 47,934,614 bushels in 1861, 43,551,149 bushels in 1860, 49,507,728 bushels in 1859, 46,654,986 bushels in 1858, 45,967,461 bushels in 1857, 42,892,188 bushels in 1856, 35,388,170 bushels in 1855, 36,819,360 bushels in 1854, 42,039,748 bushels in 1853, 41,072,486 bushels in 1852, and 40,337,412 bushels in 1851.

CENTRAL FARMERS' CLUB.

EMIGRATION: WHAT TO DO, AND WHERE TO GO.

The usual monthly meeting of the Club took place on Monday evening, March 4th, at the Club-house, Salisbury-square, the chairman for the year, Mr. E. Little, presiding. The subject fixed for discussion, "Emigration: What to do, and where to go," was introduced by the Rev. E. Smythies, Hathern Rectory, Loughborough.

The **Chairman** in introducing the subject said: Since it was announced, he had heard it said, more than once or twice, that such a subject scarcely came within the scope of the Farmers' Club. He begged to say that he differed from those who took that view (cheers). It was well-known that the farmers of England had as much difficulty in finding room to place out their sons and their families as any class in the country (Hear, hear), and therefore he thought emigration was a good thing for agriculturists generally to consider (Hear, hear). There could be no doubt that the sons of farmers would make as good settlers or colonists as persons of any other class of the community who might wish to leave their native home. This subject was naturally suggested by the discussion that followed the paper read in November last by Mr. James Howard, on "Things in America." The reverend gentleman who proposed that it should be discussed would read a paper upon it that evening, which would no doubt afford very useful information.

The Rev. E. **Smythies** then said: Mr. Chairman and Gentlemen, the subject which I have the honour to bring before you this evening is entered upon the card in the following terms, "Emigration: What to do, and where to go." The chairman, in taking his seat at the first discussion of the year, remarked that the committee were taking a wider range than usual in the subjects selected for this session, and had placed some topics on the list of a character somewhat different from those which are ordinarily brought before this society. There are, I think, obvious advantages in thus, occasionally at least, enlarging the circle of the subjects discussed amongst us; and, if any apology be needed for the question which I have been requested to introduce to your notice, it will, I think, be found in one or two facts which I will shortly mention by way of introduction. It will be in the recollection of those who were present at the meeting of last November, when Mr. Howard delighted and instructed us with his admirable paper on "Things in America," that I took occasion to make a few remarks in connection with what Mr. Howard had said about the prosperity which generally attended Englishmen who went out as settlers to the Far West, and I ventured to throw out a suggestion that emigration for farmers and farmers' sons would not be an inappropriate question for this Club to discuss. The committee were pleased to adopt the suggestion, and, I suppose, failing to find a better man, although I think they might easily have done so, they have asked me to introduce it. That was the origin of this question being placed upon the card. Another circumstance, which may tend to show that this is not an unsuitable subject to engage our attention, is this: From the time of our meeting in November down to the present moment I have received numerous letters asking for information as to the particular part of the world to which I then referred as a desirable field for emigration, and for information also, if I had any to give, as to the best mode of proceeding. So numerous, indeed, have been these letters, and so manifold the questions they asked, that it has been quite out of my power to answer them all. Many of them would have required a paper almost as long as this, to answer them fully; and my own regular avocations and duties are such as wholly to preclude my undertaking such a task, much as I should have been pleased to assist — assuming that to have been in my power—my numerous correspondents in the object they had in view. Should these words meet the eye of any of those who honoured me with their inquiries, I trust they will accept this statement of the simple truth as my apology. I would gladly have written to them at the length they requested, had it been in my power to do so without neglecting other and imperative duties. But the circumstance of my having so many letters from intending emigrants of the class of society of which this Club is chiefly composed, to one single part of the world, goes, I think, to show that emigration amongst the middle and upper classes of this country is a subject of large and increasing interest, and is therefore one, which, however feebly and imperfectly it may be introduced, is, nevertheless, a very fitting subject to engage the attention, and elicit the information of the Central Farmers' Club. One fact more I will mention, confirming the same view. Just about the time of our last November meeting, a book entitled the "States of the River Plate," by Mr. Wilfred Latham, was published. It is a thoroughly plain, practical, business-like work, upon sheep and cattle farming in the provinces of Central South America. The *Agricultural Gazette*, in reviewing this book, was pleased to say that the few words I uttered in this room, in speaking upon Mr. Howard's paper, would probably act as a capital advertisement of Mr. Latham's book, and so indeed it turned out. The first intimation I had of the existence of this book was from reading the review. I sent immediately to Longman's for a copy, but the answer was that not a single copy was left; the whole edition of a thousand had been sold off in an incredibly short time.* A second edition was published before the end of the year, and that I trust is going off as rapidly as its predecessor. For it is a good useful book on the subject—just the sort of book the intending settler and future sheep or cattle-farmer requires for his guidance before laying out his money. I shall be not a little indebted to it for much of the information I purpose laying before you this evening.

But before we come to that, I must say one word on emigration in general. Nine-tenths of the books which have been published on this question, so far as my experience goes, treat of emigration as if it was solely applicable to what are called the "labouring" classes. The Colonization Circular and other papers issued by the Government Emigration Office, Emigrants' Manuals, Handbooks upon Australia, New Zealand, and so forth, for the most part are taken up with urging the advantage of emigration to the agricultural labourer, the carpenter, the blacksmith, the wheelwright, and artizans generally, ignoring almost entirely the desire to emigrate of men of education and capital, be it more or less. Those in the position of life of members of this Club might wade through volume after volume of Colonization Circulars and Emigrants' Manuals, and find very little information adapted to their wants. They would be carefully instructed as to how many fustian jackets and gowns of blue cotton print they had better take with them, and how many shirts and chemises of strong unbleached calico they will want for the voyage, and how important it is to have a good supply of marine soap to wash them with; but they will be told very little as to the best part of the world to which to take five hundred or a thousand pounds, or the best mode of laying it out when they got there. As regards the Government office, this may be all very right, because that department was created for the express purpose of promoting and assisting the emigration to our colonies of the families of labouring people, who either could not, or would not, emigrate without such assistance. But as regards the other works of which I have spoken, there appears to me to be a great oversight in this respect, a general omission of information suited to the man who goes out more in the character of an employer than as a labourer. To this rule, so far as my experience of such works goes, there are two eminent exceptions—Sidney's "Three Colonies of Australia," and the book to which I have already referred, Latham's "States of the River Plate." Both of these books, but especially the former, are characterised as much by sound good sense as for the extensive and varied practical information which they convey to the capitalist, whether large or small, equally as to the artizan and labourer. The former book, moreover, has a charm of style about it which is seldom to be found in works upon colonization and emigration. Now, I shall endeavour to avoid the defect of which I have spoken, and shall speak of emigration as applicable to the middle and upper-middle classes of this country. It would be a waste of time to discuss the question as it applies to the artizan and labourer. If it is to be a useful subject to us who assemble in this room, it must be treated of as applicable to ourselves. Shortly to sum up, then, these introductory matters, there can be no question, I think, that emigration is a subject of very great interest to the farmers and gentry of this country; that many a tenant farmer, and not a few landed proprietors also, and gentlemen of independent means, especially those who have large families, would be thankful to know of some plan by which, either in one of our colonies or elsewhere, he could establish one or more of his sons in a useful and honourable position of life as a settler, with a prospect of a fair income, without descending to menial employment, and with a reasonable hope of laying by something "in the days of his youth, while the evil days come not, nor the years draw nigh when he shall say, 'I have no pleasure in them.'" That the usual run of publications which treat of our colonies and emigration convey very scanty information of the kind needed by this class of emigrants; and that this want of information is a want very widely felt.

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* Since this paper was read I have been told that I was misinformed by my bookseller on this point, and that there has been only one edition of the book published.

WHAT TO DO.—The first practical point, then, for our consideration is brought before us by the words 'What to do' By this I mean, What should the young emigrant from either of the classes I have described go out to do? In what channel will he best devote his energies and capital, so as to have the best chance of getting a living without descending to the condition of a mere labourer? To this question I answer, Not in agriculture; not in any trade or commerce; still less in gold digging; but in sheep and cattle farming in those parts of the world where pasturage on an extensive scale can be obtained with the least possible employment of labour. And of these two, sheep farming is unquestionably the best. The great obstacle to the success of the emigrant, who either hires or purchases a certain quantity of land for cultivation in any of our colonies, is the necessity of employing labour. Hired labour eats him out of house and home. It seems likely ere long to do this pretty much for the farmer in this country, but it is tenfold more destructive in the colonies. The reason of this of course is, that hired labour in all countries where the supply of labourers falls so far short of the demand is a very expensive commodity; and from the peculiar circumstances of the case, the labourer not only receives a high money wage, varying from £20 to £50 a year from his employer, but is generally boarded, lodged, and even sometimes clothed besides. The one main difficulty indeed, in the path of the emigrant who enters upon agricultural pursuits, is the high price of labour in all our colonies, and indeed, in many of them the very great difficulty of obtaining any hired labour at all, that is worth having. It had better be laid down broadly at the outset that emigration from England to any part of the world is not only not for the fool, as has been very justly said before now in this room, but it is also not suited for the indolent and luxurious, who require to have everything done for them by others, and who cannot shift for themselves. Many a gentleman settler, who has depended upon hired labour for all that was necessary to be done, has found himself after a year or two in this position—that whilst he furnished the capital which set the whole machine of the station going, and had all the care and anxiety of the concern to himself, his farm-servants reaped all the profit. One gentleman in Canada, after carrying on the experiment for a few years, sums up his balance-sheet in these terms: "I raise all the simple necessaries of life, it is true; but I have little or nothing to sell, because my servants and family consume all I grow; and I find that, besides this, I have to buy numerous barrels of flour and other provisions to eke out our own produce. The money for this has to be furnished out of my capital." It is clear *that* business did not answer; and although I am quite ready to allow that there are some parts of our colonies where the hard-working young farmer, who takes out his small capital, and hires two or three hundred acres of land, may obtain a fair livelihood by the ordinary processes of agriculture, still I must maintain that the raising of cereal crops is very far from the best thing he can do, and this for two reasons—first, because the cost of the necessary labour for this purpose is, as I have already said, too great; and secondly, the export of grain from such distant parts of the world as Australia and New Zealand to this country is too precarious and expensive to leave a sufficient margin of price for their profitable cultivation. Stock-farming, on the other hand, as the least costly for labour, produces by far the most rapid increase upon the capital originally invested. The produce can be transported across the seas at far less risk of injury to its quality; and the value being much greater in proportion to its bulk and weight, the cost of transit for many miles by land down to the seaboard, and thence by ship across the seas to England, bears a less proportion to the price ultimately realized. I am well aware that these are trite and obvious truths; but inasmuch as many persons do go out to our colonies with the intention of occupying, either by rent or purchase, a small quantity of land, and farming it much in the same way in which they would in England, and then find they have made a great mistake in so doing, I thought it not out of place to show why, as I conceive, the raising of cereal crops must necessarily be less profitable to the emigrant than stock-farming. The increase of flocks and herds, such as Abraham, Isaac, and Jacob had of old, fed upon the natural pasturage of an extensive run, with the least possible amount of tillage, is the true thing to look to for profit, and is what I think the emigrant should aim at, who can command the necessary capital to hire or purchase an extensive tract of wild land, and to place upon it the proper amount of stock. Indeed, I think we may claim on behalf of sheep-farming, as compared with tillage, something inherently good and amiable; the sweetness of disposition which the former pursuit seems to foster, in contrast with the latter, being due in some measure, no doubt, to the former being associated with greater profits and fewer vexations. At all events, I can claim, on behalf of my position, an illustration of the highest authority and antiquity. Abel, let me remind you, "was a keeper of sheep;" whilst Cain "was a tiller of the ground." I would strongly recommend all young men, who intend to emigrate, to aim, industrially as well as morally, at walking in the steps of Abel, and not of Cain.

WHERE TO GO.—But I must hasten on to the third point, Where to go, which will probably appear to most as the pith and marrow of the whole question, assuming that there is any marrow at all in the case. The usual fields for British emigration are, first of all, certain of our colonies, such as Australia, Van Dieman's Land, New Zealand, the Cape of Good Hope, Canada, British Columbia, including Vancouver's Island, and a few other settlements of less importance in this point of view, such as British Guiana, the Falkland Islands, and some others. Then there are the United States of North America, including California; and last, but by no means least, the vast plains of Central South America, known generally under the name of the provinces of the Argentine Confederation. Even if time permitted, and this were a suitable occasion for doing so (which it is not), it is not my intention in this paper to attempt to cover all the ground which might otherwise be properly included in a treatise on emigration. My object, to-night, is simply to call attention to a part of the world as a field of emigration for English farmers and English gentlemen, which is not so well known as it might be, and the advantages of which, especially to the man of small capital, have not hitherto been appreciated as they ought to be. I do not deny the advantages of many of our colonies for settlers; but I think that in many respects they have seen their best days as outlets for emigrants of the class of which I am specially treating to-night. There is, no doubt, an almost inexhaustible demand for artisans and labourers as immigrants in our colonies; and, no doubt, the great majority of the men of this class who go out considerably improve their circumstances in life by so doing. But I do not think there are the same openings for the white-handed emigrant in either Australia or New Zealand, or indeed in any of our colonies, as there were formerly. In Australia, the best districts for the pasturage of sheep and cattle near the sea-coast, and along the course of the few great rivers that there are, have long since been occupied; and to obtain anything like a good—that is, a well-watered and well-situated—run, it is necessary to pay either a very high price, or else to go a long way up the country into wild and unsettled districts, far from roads and rivers and all the conveniences of civilization. Besides, I believe the great joint-stock principle has been largely introduced into the sheep-farming business in Australia. Many of the great squatters have done what many of our old private banks have done—converted their interests and business into joint-stock concerns. These joint-stock companies, having great command of capital, have obtained possession of vast tracts of country, and no small portion of the best runs and sheep walks at high prices. One result of this has been to shut out the private person and small capitalist, and greatly to narrow the field for individual enterprise and investment. About a year and a-half ago I made careful inquiry respecting Australia from persons of experience in the matter, some of whom had been out there a good many years; and the general result was, that it was not much use going to Australia for sheep farming, unless you could command £7,000 to £10,000; that numbers of young gentlemen, who had gone out there, from inability to command the requisite capital to obtain a run and flock of their own, had sunk into the condition of mere labourers and stockmen, and that a few thought themselves very fortunate in obtaining situations as managers or superintendents on the properties of the great joint stock companies, at a moderate annual salary. Whilst I believe this to be true of the greater part of the older colonies of Australia, an exception should perhaps be made in favour of Queensland, the newest of all the settlements of Australia. This colony comprises the entire north eastern portion of the Australian continent. On the 10th of December, 1859, it was formally proclaimed a separate colony, under letters patent from the Crown. It contains an area of 678,000 square miles, and is therefore more than five times larger than the United Kingdom, and three times larger than France. This settlement seems to be better watered than many other parts of the continent, five navigable rivers emptying themselves into Moreton Bay alone. The upland plains and downs of the interior are said to afford excellent cattle and sheep pasture throughout the year, and the agricultural capabilities of the colony seem to be very great, the wheat especially, even in that country of fine wheat, being pre-eminent for its quality. But I need not occupy your time with a detailed description of this, or indeed of any of our colonies, because those who may wish to go to any of them can obtain the fullest information from any of the numerous handbooks on the subject of emigration, or from the Colonization Circular, issued by the Emigration Commissioners. But there is one pursuit, about which I can find nothing in the books, which seems well adapted to Australia, and which I have reason to think would be at least as profitable as any, and more profitable than many, especially in Queensland, and that is the breeding of horses from the best blood, procurable in this country. This is a pursuit which may have an attraction for some young men, who have a soul altogether above the more humble occupation of sheep or cattle breeding, and who might find it an advantageous business, albeit there are no noble dukes or sporting marquises out there, to buy the yearlings at two or three thousand guineas a-piece. There seems to be a large demand for the best class of horses, not only for export to India, but for home consumption in Brisbane and other towns of the settlement; and I may mention one fact—not perhaps generally known, but which was stated to me by a friend, who had carried on horse breeding extensively in a district adjoining to Queensland—that he found the natives made particularly good grooms and jockeys; that they were very careful of their horses, became very fond of them, and rode to admiration. I should not be surprised if some of those of the present day, who are fond of doing sensational things on the turf, were to import two or three little Australian piccaninnies, who could ride from four to five stone each, and give them a mount at Newmarket and Epsom. The Australian natives would doubtless considerably astonish our own. To return, however, to the graver matters of which I was speaking, I have the less need to enter upon further details relative to Queensland, because here, as in all the other colonies of Australia, I believe, the system prevails of selling the Crown lands by auction at a minimum price of £1 per acre, and the prohibition under the land-granting system, of any man having, either by purchase or lease, or both combined, an occupation exceeding 320 acres. In other words, the design of the local legislature, who are the authors of this act, is to promote the tillage of land, and therefore small occupations. However desirable this may be in their eyes, it is not so in ours; it would be fatal to the emigration of all except those who are half-labourer half-farmer. But I must hasten on. I have already dwelt longer than I ought on the negative view of the subject. It is unnecessary that I should go through the list of all our colonies seriatim, and point out why, in my humble judgment, they are not the best parts of the world for the settler of the description of which we are treating to-night to betake himself to, and there to invest his capital. The same grand objection which bars Australia applies also, with some modifications, to our other colonies. However desirable as a field of emigration New Zealand may have been 30 or even 20 years ago, it is not so now. Not even in the Canterbury Settlement can good-sized runs for the pasturage of sheep be obtained now at a moderate cost. For here also, the same fatal system of the sale of the Crown lands at £1 per acre, initiated by Gibbon Wakefield I believe, still prevails. Canada again is a country of vast forests, and rigorous winters. The mere clearing of the land alone would absorb all the capital of the settler of moderate means; whilst the seven months' winter would be an insuperable obstacle to the inexpensive maintenance of a large stock. At the Cape of Good Hope the soil is of rather a sterile character, and, I imagine, is not well adapted to a superior class of sheep. The sheep of the country seem to have a tendency to concentrate all their fat in their tails. If we see an estate advertised for sale somewhere—say, amongst the romantic hills of Wales, where it turns out that 1,000 acres are let for a rent of £150 a-year, we can form a pretty shrewd guess at the quality of the land without going to see it; and so, when we know that the upset price of Crown lands in Australia and New Zealand is £1 per acre, and then find that under a similar Government rule at the Cape and in Natal the price is only 4s. an acre, we cannot form a very exalted opinion of its fertility.

I pass now from our colonies to the United States. I have here some papers, which were kindly forwarded to me by a member of this Club, and which set forth very fully the terms on which land principally in the Western States can be obtained. Mr. Wilson, the Commissioner of the General Land Office in Washington, explains in his letter very clearly the States in which good land, well situated, can still be obtained at the price of 1¼ dollar per acre. This is in what are called the Public Land States, and of these there appear to be only the States of Upper and Lower Michigan and Wisconsin east of the Mississippi, whilst west of that river there is almost an unlimited amount of unoccupied territory. Still the same policy in regard to the disposal of land seems to prevail here in the main as in our own colonies, viz., that of forming small farms, to be occupied by a class of settlers who would cultivate them chiefly by their own labour. East of the Mississippi the public lands are subdivided into tracts of from 40 to 80 acres each, and in some of the States they run as large as 160 acres. Now this system of small farms, to be brought more or less under the plough, for reasons I have already stated, does not fulfil my ideal. Besides, I confess to some little prejudice about the whole political system of the United States. A boot-maker in New York, taking off Charles Dickens's boot to measure him for a new pair, held it up, and surveying it with supreme contempt, remarked through his nose, "I pity the man who lives under the institutions that produced that boot." Now quoad the boots, I care nothing for the institutions, provided only the boots fit and wear well; but I confess to a dislike to living under the institutions which have produced the whole state of politics at present existing in the United States. I should be sorry to see either our own institutions at home, or our young settlers abroad, Americanized. I would rather, speaking for myself, take the chance of our own colonies than go to the States, although I am quite willing to believe that they present a fine field in many respects to the enterprising settler.

The Argentine Confederation.—I come now to speak of the country which I believe to be beyond all others best calculated to fulfil the conditions of the hypothesis upon which I have all along proceeded—the provinces of the Argentine Confederation in South America. This is a country which, up to a recent period, and even to this day, is much less known than it deserves to be; I will therefore first give a short description of it. The country known as the Argentine Confederation or Republic lies on the southern bank of the great river, or rather estuary, of the River Plate, and west of the Uruguay. It lies between the 22nd and 40th degrees of south latitude, is bounded on the east by the river Uruguay, and on the west by the Cordillera, or the great line of the Andes; it extends over about a million of square miles. [It should be remarked here, that Mr. Smythies frequently referred in this part of his lecture to an excellent map of South America, lent for the evening to the Club, with one of North America, by Mr. Edward Stanford, the eminent Map Publisher]. It includes the following fourteen provinces: Buenos Ayres, Santa Fé, Cordova, Mendoza, San Juan, Santiago, Tucuman, Salta, Rioja, Catamarca, San Luis, Jujuy, Entre Rios, and Corrientes. its chief city and port being Buenos Ayres. Besides these fourteen provinces which constitute the Argentine Confederation, there is the small independent State called the Banda Oriental, or the Republic of Uruguay, for it is known by both names indifferently. This State lies on the southern limits of, and is bounded by, the Brazilian Empire. Its eastern coast lies on the Atlantic, the river Plate washes its southern shore, and the magnificent river Uruguay forms its western boundary. The whole of this vast territory is watered by some of the noblest rivers in the world—the Rio Negro, running through the centre of the last-named province; the Uruguay, separating the Banda Oriental from the Argentine Confederation; the Paraná, passing through the centre of the finest provinces of the Republic, and having a navigable course of over one thousand miles; the Salado, and several others of less note. The estuary of the Plate, or La Plata, bears the same relation to these rivers, that the Humber does to the Trent, the Ouse, and other streams, constituting the great central river basin of England. Mr. Latham says: "The delicious and salubrious climate, the extreme fertility of the soil, the wide range and capabilities of production, and the unsurpassed adaptability of these countries for stock breeding, as well as the extent of their river system, mark them out as eminently favourable spots to receive an European emigration, and offer many opportunities for the advantageous investment of European capital. The natural richness and extent of these resources, the facilities of water transit, and the paramount desire for progress which animates the influential portion of the population, their commercial tendencies, the unfeigned welcome and protection extended to foreign settlers, and the full recognition of the advantages derived from immigration and foreign enterprise, are in themselves guarantees both to settlers and to individual or Stock Exchange investments. Moreover, the recognition and thorough comprehension on the part of the governing classes of the importance and policy of national good faith, is a feature which necessarily must weigh with capitalists, and produce its fruits in the development of the incalculable resources of the country." As security for investment will always be a primary consideration in determining the choice of the emigrant, the following *resumé* of the constitution by which the Confederation is governed may be useful: "That the inhabitants of the State have a right to be protected in the enjoyment of their life, honour, liberty, and property, and that no one can be deprived of these, except conformably to law. That slavery has no existence, and that the introduction and sale of slaves be for ever prohibited. That all men are equal in the eyes of the law, both in its protection and penal consequences, no other distinction being acknowledged but what may proceed from talents or moral worth. That men in their private actions, when they do not infringe on public order, and are not prejudicial to a third person, are responsible to God alone, and are exempt from any magisterial authority. That intercommunication by discourses, by private writings, and publications of the press are entirely free on all subjects, the author and the printer being held responsible before the law for any abuses that may be committed. That any individual may devote himself to any business, trade, or branch of industry that suits him, if it is not contrary to the public good. That every individual is at liberty to enter, to remain in, or to depart from the territory of the Republic, when and how he pleases, so long as he complies with the laws, and does no injury to others. The laws on commerce are in strict harmony with this political liberality, and the port laws equally favour and protect shipping. The utmost religious freedom and toleration exist throughout the Republic, and in the capital and chief towns there are English and Scotch Protestant churches." I will now proceed to give a general outline of the country and the nature of the soil. [The reverend gentleman here made frequent reference to the map of South America before mentioned.] A large portion of the country is peculiarly favourable for farming operations. There are vast plains extending for a great number of leagues as level as the table before me. My son writes to me that I can hardly conceive the levelness of the country and its freedom from timber. Compare these plains with the bush of Australia, or the mountainous land of New Zealand or the Cape, and you will see how greatly the advantage as regards surface is in favour of South America. The soil of these level plains is an alluvial soil; and I am told that if a native, in riding over a distance of 100 or 150 leagues, finds his horse's foot kicking against a stone, he gets down and puts it in his pocket as a rarity. I am not speaking now of the Banda Oriental. Of course there is a good deal of rock there. Speaking generally, however, I may remark that the soil is well adapted for pasturage, and, with a little management, an acre will support a large number of sheep. I do not like to trust myself to give figures; but it is calculated that an acre there will carry twice as many sheep as an acre in Australia, and nearly three times as many as an acre in New Zealand. No doubt some parts of the country are better adapted for cattle than for sheep. The vicinity of Buenos Ayres, which has been the longest settled, is best suited for sheep, and sheep-farming is most carried on, that part being further than many others from the tropic. Climate has, of course, a good deal to do with the success of the sheep farmer. The land of Buenos Ayres being so well situated, the price places it beyond the reach of many emigrants. Land is sold there, both by the Government and by private individuals, by the square league and thousandth parts of a league, no heed being taken of quantities of less than six acres. It is difficult, it appears, to obtain land in the province of Buenos Ayres, under from £5,000 to £7,000 the square league. Further to the north, in Santa Fé, Cordova, Tucuman, and other parts, there are large districts which are naturally well adapted, first of all, for cattle, and afterwards for sheep. The country having a rich virgin soil, the first thing necessary is to graze it with cattle, and after that there springs up a fine sort of herbage, well adapted for sheep. In the north, land is very much cheaper than in the south; but, on the other hand, there are some disadvantages. One of these is the existence of what is called arrow grass. It is so called in consequence of the seed pods being almost as sharp as a spike of steel. Many sheep are wounded by this arrow grass, and, of course, wounds are more dangerous in proportion to the heat; but this difficulty may be got over by means of the careful grazing of cattle in the first instance. Great care is necessary in the purchase of land from private firms or individuals. My son had a very narrow escape from being taken in by certain land-jobbers in Buenos Ayres, for jobbers are by no means confined to Capel-court. There is a well-known Scotch firm who have grown rich in that trade. There are many Scotch firms, and therefore no firm can sue me for libel (laughter); but it is notorious that the firm to which I allude have taken in numbers of young Englishmen, and obtained their money for the purchase of land which was absolutely worthless. My son and his friends had almost signed an agreement, but happily they found out the mistake they were making just in time. Those emigrants who land at Buenos Ayres will soon find out the name of the firm in question, and therefore I need not bring myself under the clutch of our somewhat peculiar libel law (laughter). Let me now mention a few practical points with regard to the best mode of proceeding. By all means, let the young emigrant purchase if possible, and if he has not capital enough himself for that purpose let him unite with others. Indeed, so far as I can learn, it is always the best course for three or four emigrants to unite, and put their capital together, selecting one of their number as captain before they go out, and abiding by his orders. There are many social and material advantages in that course. It will be a protection, and save a vast amount of trouble and expense. On arriving, let them first of all obtain an introduction to some settlers who have gone out before them. Persons having letters of introduction would receive an invitation from settlers, who would, for a certain period, find them all they wanted—bed, board, and a horse to ride upon—in return for their services; and, in a few months, the new emigrant would have obtained knowledge and experience which would enable him to keep clear of land-jobbers and land-sharks generally, and to commence for himself with a fair chance of success. Above all, let the emigrant avoid the common practice of taking a lease of land. He can only obtain a lease for three years; and the mere fact of his occupying it with cattle or sheep for that period will make it worth a great deal more; and, at the end of the three years, the occupier will either have to pay an enormously increased rental, or be turned out, and so have to begin again. It is very difficult to name the price of land in consequence of the rapid increase and great variations in value; but, so far as I can gather from my son's letters and from Mr. Latham's book, if a man goes a moderate distance up the country, he can get a square league of good land, well situated and well watered, at from three to six hundred pounds. My son and his partners gave £600 per league for the two and a-half square leagues which they possess. As I have before intimated, if an emigrant cannot find persons to unite with him, he should, at all events, place himself for a few months with some respectable settler, and he will then be enabled to judge of the value of land before purchasing. The price increases enormously with farming operations. That which was sold for £600 this year will fetch £900 next year. By all means, I would repeat, let emigrants purchase, instead of taking leases; but there is nothing lost by their looking around them for a few months, and seeing where they can purchase a good flock of sheep, and lay out their money most advantageously. Then as to the cost of sheep: that varies like the price of land—it varies from 3s. to 10s. a-head. 10s. a-head is the price of what may be called improved sheep, that is, sheep bred from rams carefully selected, either imported rams or rams bred there for the special purpose of improving sheep. And here comes in a question of increasing interest to all English settlers, namely, what breed of sheep it is best to import. I feel totally unable to say whether it is best to import the Lincoln ram, or the Leicester, or the Southdown.

Mr. Congreve (of Peter Hall): Southdowns.

The Rev. E. Smythies: I am very glad to have elicited that opinion from so practical a man. We all know that if Lincoln sheep are removed to the midland counties a great deal of the lustre of the wool and other qualities is soon lost. There are peculiarities of position and soil which affect the quality of wool, and I think what the settlers of Australia, New Zealand, and the Argentine Confederation want to know is, what breed of sheep will, if imported, under varying circumstances of soil and climate show the greatest utility and stability of character and be most likely to transmit any merits that it may possess to its offspring. I am inclined to think that the Southdown is, on the whole, the best to import. But on the other hand, it should be borne in mind that a short-woolled sheep of this country yields fine wool, and that what settlers want is length and vigour of staple. A sheep that produces a fleece of only 3lbs., selling at from 5¼d. to 6d. per pound certainly admits of great improvement, and this is one of the wants of the day in South America. Another desirable improvement is a better classification of sheep. At present the rams are too often allowed to mix with the ewes of all ages and at all times of the year indiscriminately, and the consequence is a great deterioration in the quality of the flock. I believe that a very large margin of profit is to be obtained by attention to these points. At present I believe a very good flock of sheep, taking all that walk, that is one with another, may be obtained in the Argentine Confederation at about 5s. 6d. a head. Let me now say one or two words about the increase. I have prepared a statement taken in a great measure from Latham's book and based upon actual experience, of what actually occurred on a fair average run. Supposing that in January, 1865, there is a flock of 4,000 breeding ewes and 1,000 ewe lambs, the result will according to Latham's table be as follows:

1866.—4,000 ewes will have yeaned in April and May	1,600 male lambs. 1,600 ewe lambs.
Original stock	5,000
	8,200 head.
1867.—5,000 ewes will yean	2,000 males. 2,000 ewe lambs.
Previous year's stock	8,200
	12,200 head.
1868.—6,600 ewes will yean .... (5,000 and 1,600)	2,600 males. 2,600 ewe lambs.
Previous year's stock	12,200
	17,400 head.
1869.—8,600 ewes will yean .... (5,000, 1,600, and 2,000) ...	3,440 males. 3,440 ewe lambs.
Previous year's stock	17,400
	24,280 head.
1870.—11,200 ewes will yean......... (5,000, 1,600, 2,000, & 2,600)	4,480 males. 4,480 ewe lambs.
Previous year's stock	24,280
Total head at shearing time..	33,240 head.

This is calculated at 80 per cent increase. Losses will be more than replaced by the excess of increase over 80 per cent.

My time is more than gone, and I have said nothing about the great beef question. A great deal has been said in modern days about the utilization of the beef of South America by importing it into this country. On this point there is, I may remark, a general misapprehension. It is not the long transit by sea that constitutes the great difficulty, but it is the fact that the cattle are poorly fed and then have to be driven so far before they reach the slaughtering places that the beef is in a very bad condition before it can be salted. The remedy is not to be found in science, but in a better system of management; and with this, South American beef might perhaps arrive here in a perfectly good condition. Some of you may have heard of the mode of preserving by covering the beef over with paraffin. If there be one thing more horrible than another to our olfactory nerves it is perhaps paraffin: but it is said that when the beef thus preserved has been simply washed with cold water it is perfectly sweet. I have no doubt that we are entering on a new era in this respect, but the first thing to be done is to improve the system of management, including the feeding, the slaughtering, and the packing. I will now bring these desultory remarks to a conclusion by saying that I think that many young men, with some command of capital, if they could make up their minds bravely and honestly to go out to such a country as the Argentine Confederation—and surely there are in many districts farmers' sons who do not know what to do with themselves, how to walk in their fathers' steps, or to obtain a decent livelihood at home (Hear, hear)—would have reason to be more than satisfied. No one can feel more than I do that it is not only want of time but want of ability also that has caused my remarks to extend to such a length; but if it should turn out that I have said one word to assist the class in whose behalf I have been speaking I shall be thankful. If I should have put it in the power of any individual to gratify the feeling so beautifully described by one of our poets,

> "The pride to rear an independent shed,
> And give the lips we love unborrowed bread,
> To skirt our home with harvests widely sown,
> And call the smiling landscape all our own,
> Our children's heritage in prospect long—"

if I have done that, I say, I shall be most thankful for having had an opportunity of bringing this subject before the Club. Gentlemen, I thank you for the kind patience and attention with which you have listened to my long and desultory remarks (cheers).

Mr. G. M. Allender (Aylesbury) said he regarded emigration as one of the most important subjects that could be brought under the notice of farmers. The only remedy that he could see for the increased value of land in this country, the benefits of which were almost entirely confined to the landowners, was to encourage emigration on an extended scale amongst tenant farmers, and he regretted that their attention that evening had been almost exclusively directed to South America as a field for emigration. After the reading of Mr. James Howard's paper last November he (Mr. Allender) wrote to the immigration department of the Government of the United States for information with regard to the unoccupied lands. On receiving a reply, accompanied with several documents and a valuable map, he at once sent them to Mr. Smythies, and as they had only been returned to him that evening, he had of course not had time to make much use of them prior to that discussion. One of the points referred to in the reply of the Commissioner had a very close connexion with some of the remarks just made by Mr. Smythies in reference to land speculators. The Commissioner of Immigration, writing from the Department of the Interior, on the 24th of December, 1866, said. "In regard to the apprehension that all the best lands and positions had already been disposed of, it is proper to state that in the older settled-land States of Ohio, Indiana, and Illinois, the public lands generally have been disposed of to actual settlers; but in other States hereinbefore mentioned, tracts to an immense extent of good land, well situated, may be obtained. In the States of Minnesota, Iowa, Wisconsin, Missouri, and Kansas, in the valley of the Mississippi River, in the State of Michigan, in the vicinity of the great Lakes, in California and Oregon on the Pacific, and in the territories of Washington and Nebraska, large bodies of good land, both prairie and timber, are now subject to sale at private entry at 1 dollar 25 cents per acre; and in the five first-mentioned States, and in Nebraska, the soil and climate are held to be admirably adapted to the raising of such stock as is alluded to by your correspondent. There are also good lands well situated in Arkansas, Mississippi, Alabama, Louisiana, and Florida; but in those States the public lands are *only* subject to entry under the Homestead Act, approved June 21st, 1866, a copy of which Act is herewith enclosed." Here then they had 5s. per acre for land in the United States, against £1 per acre quoted by Mr. Smythies as the price of any farming land within a reasonable distance of any town in South America; and let it be borne in mind that in the latter there was nothing like such means of transit as existed in the former.

The Rev. E. **Smythies**: There are good rivers.

Mr. **Allender** doubted whether even in that respect the advantage was not in favour of the United States. He had received letters from South America which showed that on one of the points referred to by Mr. Smythies —namely, horse breeding—the advantages possessed by English settlers were very doubtful. It was there stated that the horses even of English settlers had been taken forcibly for war purposes to a very great extent.

The Rev. E. **Smythies**: No doubt, then, they were paid for.

Mr. **Allender** continued: He had the fact which he had just stated from a gentleman who had been resident in South America for thirty or forty years. In a report for 1866 relating to public lands, issued by the United States Government, it was stated that these lands were found on revised data to contain 1,465,468,800 acres, and that from the beginning of the system to the end of the last fiscal year the aggregate area surveyed was 474,160,551 acres, leaving unsurveyed 991,308,249 acres. There were three ways of obtaining land in that country. One was by the homestead law, under which any emigrant, on signifying his intention of becoming an American, could claim 160 acres of land free for ever, after he resided on it for five years. Another mode was to settle on any of the unsurveyed lands; in which case, when the Government surveyor came, the squatter had the pre-emptive right of purchasing the land at the upset price of 5s. per acre. Lastly any man with sufficient money in his pocket could at once purchase of the Government some of the land which was offered for sale every month at a dollar and a quarter per acre, if he were the highest bidder. This too was in a country which was within a ten-days' voyage of our own land.

Mr. **Parish** (Her Majesty's Consul at Buenos Ayres) said he came unprepared to address the meeting on a subject of that wide extent; but, having passed many years of his life at Buenos Ayres, he wished to make a few remarks. With regard to that part of South America as a field of emigration, speaking from his own experience, and from those general impressions which a man must obtain from such close connection as he had been brought into with his own countrymen during a long series of years and under different circumstances, he should say there was no part of the world where the emigrant was better received and better protected by the laws of the country, or where there was less of invidious distinction drawn between him and the native of the country. He believed also that there was no country in the world which offered a more extensive field for man's intelligence and labour (Hear, hear). Some capital was requisite to ensure a fair chance of success; and as regards the farmer class, he was of opinion that no man would find himself in a position to prosper if he lowered himself to the condition of a common labourer, and had to fight against difficulties of all kinds, which would in all probability break his back before he had begun to make his fortune (Hear, hear). He had, during his long residence there, observed many parties of emigrants who had gone to South America, and had seldom seen a man return to his own country discontented, while on the other hand he had met with many who had made large fortunes. People from England now occupied most influential positions as capitalists, merchants, traders, or landowners. In some parts of the country you might travel for fifty or sixty miles continuously over Englishmen's land, which was, of course, a great advantage as a nucleus for fresh settlers. Invitations were being sent to this country by emigrants of every class, inviting relatives to join them. He believed that if the part of South America in question were better known, it would be better appreciated; but, unfortunately, the history of that country was a history of civil wars, and, considering how large a portion of the world was now open to emigrants, it was not surprising that little was known of the Argentine Confederation beyond the outlines of its history. The position of that country, however, had altered very much of late years; there was a steady progress going on under a most liberal Government, which afforded a full amount of protection, and every reasonable facility to the foreigner in earning his living, and assisting the native population in developing the resources of the country. The tenure of land was one great attraction. The system of registration, which formed the basis of the old Spanish title, was far more simple than anything of the kind in this country. There was, in short, no difficulty in buying land with a good title. As to the price of land, it was infinitesimal. In reference to a remark made by the gentleman who followed Mr. Smythies, he might observe that he could cite instances in which land had been sold, within twenty or twenty-five miles of a railway at 1s. per acre, which land was now occupied by Englishmen of good family. If settlers did not mind exposing themselves to a little danger from the Indians by settling on the frontier, they might get land almost for nothing; but even within the range of civilization, in well populated districts, the average price of the most eligible and most favourably situated land was 20s. per acre, and that land would bear three sheep per acre. Probably, in the course of a few years, as population and the supply of labour increased, much of the land now used for pastoral would be employed for agricultural purposes, and a large portion of the plains of the province of Buenos Ayres consisting of rich virgin soil, which, with proper cultivation, was capable of bearing anything, would assume a very different character and value. He was very glad to witness the interest which was manifested in this subject, not only by the reverend gentleman who introduced it, but by those who listened to him. It was painful to him, on returning to England, after a long absence, to find so little known of a country which presented such great advantages. He had lately endeavoured to induce those who wished to emigrate, because they could not bear up against the competition in their own country, to turn their attention to South America; and he would recommend any man who was in that position, whether he were a labourer or an intelligent farmer with a little capital, to choose the country with which he had been so long connected in preference to any other.

Mr. Hall (from the Cape of Good Hope) said, having resided for nine years in that colony, where he was extensively engaged in sheep-farming and horse-breeding, he had come there with the hope of hearing from Mr. Smythies some remarks in reference to other regions besides Buenos Ayres. The Cape was in the same latitude as the River Plate, and had, he believed, the same kind of climate. Sheep-grazing was carried on to a very large extent; and, as they were of course aware, from the returns of the wool sales, it was a very large wool-growing colony. It was also a very large cattle and horse-breeding country. It was, in fact, becoming a depôt for the supply of the Indian army with horses; and, the distance being only half the distance from Australia, it was much more available for that supply. Having resided at the Cape for nine years, and purchased a large quantity of land, intending to return and carry on operations on an extended scale, he must say that he felt sure that as much money was to be made there as in any other part of the world, provided a man took out capital, was careful in the selection of his land, and kept out of the hands of land-sharks and land-speculators, who abounded in all parts of the world (Hear, hear). The position of an emigrant, on landing, resembled that of the sailor, who so often fell into the hands of the crimps; and the sooner he became connected with some one who had had some years' experience in farming, and the less he had to do with land-jobbers or colonial merchants, or anybody connected with trade or bankers, the better chance would he have of getting on. He had purchased a large quantity of good land at the Cape, at from 6s. to £1 per acre. He had recently bought, for another person, a sheep-farm of fifteen hundred acres for £150; and that land would carry one and a-half sheep per acre. As regarded the importation of sheep from this country, Mr. Smythies recommended the Southdown. From his experience as a colonist, he should say that the Southdown was about the worst sheep for importation. For the meat, the animal was not worth killing, in a wool-growing country; and in South Africa they had found that negretti and Rambouilli, and long-woolled rams answered best. With a flock of sheep numbering about two thousand, the increase in his case had been from eighty-five to ninety per cent. for each 100 ewes; but he had taken great care of his sheep. He had employed Englishmen, at high wages to look after them; and the sheep were counted every night, to prevent theft. If English sheep were imported, they would require grass to be laid down for them; and that had never been attempted, except in Australia and New Zealand. Moreover, the importation of breeding rams was in the hands of merchants; and farmers had to pay enormous prices in order to improve their breeds in that way. Mr. Smythies mentioned sheep with large tails. He (Mr. Hall) had heard of such things; but, though he had been in the colony for nine years, he did not remember having seen one (laughter). He believed that, if sheep of that kind were driven about the colony of South Africa, it would attract a large crowd to stare at them, just as much as if they were driven through Fleet-street ("Hear, hear," and laughter). The average weight of sheep in the colony, clean meat, was 40 lbs.: the value from 8s. to 20s., and that of the wool about 1s. 6d. to 3s. 6d. per head. Horses were bred in very large quantities, particularly up the country, in the neighbourhood of the Orange River, where some settlers had as many as from twelve to fifteen hundred. The improvement in the breed was very trifling, there being very little demand, except for the postal service, waggon-traffic, and so on; and wear-and-tear consumed great numbers. He would add that, if any member of the Club desired further information with regard either to the Cape or Natal, and would communicate with him, he should be happy to answer any questions.

Mr. Samuel Sidney said he was equally surprised and gratified to hear Mr. Smythies mention as he did the book which he wrote with a great deal of enthusiasm fifteen years ago—a book which had an enormous sale at the time, but which was now out of print, and which he had supposed was dead and forgotten. At that time he looked with a great deal more pleasure on the prospects of emigration than he did at present; and for that reason he was the more gratified that Mr. Smythies had called their attention to a new district. It appeared to him that a great number of old colonies were, as regarded the white-handed emigrants—and he believed he was the inventor of that term—worn out (Hear, hear). When he wrote that book, he thought there could be nothing more delightful than for a young man to leave his country and go to another. He now looked upon emigration with different eyes, as a sort of thing that must sometimes be taken like physic, but which one would be much happier for doing without (laughter). He thought it was most important that farmers and farmers' sons should be warned that, although five-and-twenty years ago young people going out to a colony with a little money in their pocket and intellect to guide them were almost sure to do well, the case was different now (Hear, hear). The colonists would not tell them that, for they were very anxious to have among them hardy and well-to-do young fellows who might assist them; but many emigrants had learnt to their sorrow that a young man going out with a small capital had no chance of contending against the competition to which he was exposed. He knew several instances in which young men—good farmers—who had emigrated to a colony without, returned after the lapse of several years no better off than when they went out. Take the case of Australian sheep-farming. If a man got his land cheap, and if he had three or four thousand pounds, and a great many good qualities which were not to be found in everybody, he would perhaps succeed; but he had heard that many Australian sheep-farmers were turning their attention to the River Plate country. With regard to Queensland, he must remark that he had received accounts recently which did not at all correspond with the description just given by Mr. Smythies; on the contrary, it appeared that the colony was only just recovering from the effects of a fearful drought. One firm of Liverpool had lost 20,000 sheep by drought alone. Added to this, the Government of Queensland for a short time stopped payment, and had to resort to a bank at Sydney for assistance; though, owing to the success of a loan recently in the English money market, it would probably be enabled now to go-a-head again (laughter). As to New Zealand, it appeared that the settlers who were doing best there were the industrious Germans, who went out with strong wives, and well understood agricultural economy. Such people worked in the night when it was too hot to work in the day, and made their wives work too (Hear, hear). They chose very fertile land, got capital prices for all that they produced, and were many of them making money very fast. Still there was a general deficiency of water, and there were occasional droughts; and though a great many people who worked very hard did well, the country was certainly not an El Dorado. With respect to the Plate, he had seen a letter from a young gentleman, a settler there, which mentioned two drawbacks, one being that the overseers were very much given to drink, and the other that nearly all necessaries were very dear. The writer said you could not open your mouth under a dollar, and it took two dollars to fill it (laughter). It was quite clear that no one could live in the towns there without great expense. He thought Mr. Smythies was mistaken about the quality of the wool. The other day he saw some wool from the Plate which was valued at 6s. per lb. It was equal to the best Merino, and was like the very finest silk. People who went out there should go with their minds like a blank sheet of paper, and learn their business on the spot. When he first began to deal with the subject of emigration, he was as confident as most people; he did not think even their friend Mr. Mechi laid down his opinions with more authority (laughter); but he had since learnt to be more doubtful, and he would now recommend a young man who went out as an emigrant to go with no fixed ideas (Hear, hear). A great many handbooks were published that praised particular colonies, and some of them were issued by persons who were interested in particular trades. The other day he opened a pamphlet, in which the intending emigrant was recommended to take a couple of broad-wheeled waggons, and a great many other things, to New Zealand; and if he knew anything about that island, the emigrant, if he bought them, would find them perfectly useless when he got there. One great advantage which a colony possessed was this: there were many young men in this country whose characters were somewhat gypsyish, and who, if they were persons of fortune, would be travelling round the world, or going with young men like Lord Milton over the Rocky Mountains. In a colony such people might find employment for their superfluous energy, and prove very useful, but not if there was a risk of their taking to drinking, and drinking in the climate of Australia soon produced insanity. In conclusion he would suggest to Mr. Smythies that he should not repeat that table which he had read about the sheep increase.

The Rev. E. Smythies: It is a fact.

Mr. Sidney continued: But there was so much in regulating and controlling circumstances in such matters that it was like calculating how much wheat they could get out of a field by sowing grain in a flower-pot (laughter). If sheep had always plenty of grass and all other circumstances were favourable, they might expect a large increase; but as to those tabular statements—he would not say they were delusive, but they were annoying things (laughter).

The Rev. John Congreve (Rugby) said he thought no apology was needed for introducing the subject of emigration to the Farmers' Club. He quite agreed with his friend Mr. Smythies that it was a very fit subject for their discussion. He had lived long enough to know that in life ideas were very apt to become facts, and he hoped that the Club would have many such papers as the one read to-night.

Mr. J. A. Nockolds (Stort Lodge, Bishops-Stortford) thought it was very important to guard against the moral injury to which young emigrants were exposed. A man left England with a good character. For ten years after perhaps nothing was heard of him by his friends in England; he was, in the course of business, continually in the company of roughs and rovers, and Bohemians, and the result was that his ideas of right and wrong became warped, and to such a man young persons were often sent on the strength of his former character. He mentioned this to illustrate how necessary it was that farmers should be careful to whom they consigned their sons as companions in a colony. He had known several instances in which young men had been completely misled and their prospects ruined by a sort of chance mode of introducing them to people with whom their fathers had some slight acquaintance a few years before (Hear, hear).

Mr. W. J. Brown (Hazlebury, Box, Chippenham), said as this was a question affecting the destiny of farmers' sons, he hoped the farmers of England would forgive him for saying that there were many cruel parents to be found among them. Parents now-a-days brought up their sons in a very different style from that in which they could expect to live if they emigrated. The first thing that the fathers of many young farmers did in the present day, after their sons had left school, was to mount them on a horse and send them to this or that sport, instead of setting them first to perform the practical duties of farming at home, so that they would be prepared to encounter such difficulties as men must meet with when they had landed on distant shores. He was brought up practically himself, and could do any kind of work that had to be done on a farm (Hear, hear). After this, he wished to be understood he did not object to a little sport, for no one was fonder of it than himself. They should all learn how to do small things; for though they might not be required to do them in after-life, they would be all the better for having acquired the power, while of course they would be in a far better position should they ever require to exercise it. In a paper which was read not long ago by Mr. Edmunds, of Rugby, or in the discussion, it was remarked that the great difficulty of farmers with regard to their sons was, to know what to do with them between the time when they left school and the period when they would be fit to enter into business for themselves. There would be no difficulty in that respect if farmers would only train up their sons in the manner that he had mentioned.

The Chairman in closing the discussion observed that they were all very greatly indebted to the Rev. Mr. Smythies for the manner in which he had brought the subject before them. His paper showed that he had paid great attention to the subject, and he had brought forward some very important facts which would be read with great interest by many who were not present. There was one thing which had often struck him in connection with the question of emigration, namely, that whether a man emigrated or stayed at home, untiring energy and perseverance were indispensable to success. Whether a farmer's son were sent abroad with a few hundred pounds in his pocket, or whether the same amount was entrusted to him at home, without intelligence, industry, and perseverance, the money might just as well have been thrown into a ditch (Hear, hear).

The Rev. E. Smythies in reply, adverting to Mr. Sidney's criticism on what he had given as the increase of sheep in the Argentine Confederation, observed that it was simply a quotation from Mr. Latham's book; and the very fact that the work was published by Messrs. Longman & Co. was some guarantee for it as an authority. Latham's statement was, in effect, that, with ordinary care, a flock of sheep would double itself in three years, while a herd of cattle would do so in rather less than six years. He had not wished to pass over our own colonies, but he believed that on the whole South America afforded the best opening for the class of persons whom he had kept in view. In his letter his son gave an account of the ordinary daily life of himself and his two partners. They rose at four o'clock in the morning. Immediately after, they turned the sheep out of the corral, where they had been kept during the night, and got their horses saddled and lassoed. They breakfasted at five. They were employed up to eleven in tending the sheep and cattle, which they did—as indeed they do everything there—on horseback. By eleven it was too hot for the sheep and cattle to graze, and they were then driven to shade and water. Soon after eleven came dinner. Their living, he might remark, seemed to improve with every letter that was despatched. At the time of the last accounts they were getting corned beef prepared by their own Scotch woman-servant. They had coffee and biscuits, butter and milk, and sometimes tea, for breakfast; for dinner they had roast mutton and roast beef, potatoes and boiled pumpkins; and supper was of the same character. Bread they did not obtain. After dinner, in accordance with the universal system of the country, they had a siesta, lasting two or three hours, and their having risen at four helped to prepare them for it. A little before sunset they put their sheep and cattle in the corrals; after which they unsaddled their horses and turned them into the paddock, and they then prepared for bed. Numbers of persons leading a life of that kind had made fortunes in a few years, having begun at about 20, and returned at from 30 to 35 years of age. A friend of his had met with a gentleman residing at Harrowgate, who had thus made a large fortune.

A MEMBER inquired what Mr. Smythies meant by a large fortune.

The Rev. E. SMYTHIES replied that the gentleman had every appearance of being a man of fortune, and could hardly be worth less than thirty or forty thousand pounds. On the other hand, a young Englishman with no capital was almost sure to sink into a very low position, and it would be almost impossible for him to rise again. In order to attain success it was necessary to go out with a capital of six or seven hundred pounds. There were, undoubtedly, difficulties to be encountered. The Indians were ugly customers, and on the frontiers were very troublesome; but they had no quarrel with Englishmen, and as a general rule avoided coming in contact with them. Moreover, it was a peculiarity with them that they never used fire-arms, but stuck to their arrows and spears, and Englishmen would, in case of necessity, have no difficulty in defending themselves. One word as to the religious ordinances the settlers could obtain, and he hoped no Englishman would go out to a distant land without bestowing grave thought and care upon this point. An emigrant going out to that part of the world must in most cases not only be a law unto himself, but religious ordinances unto himself. It was not possible to have religious ordinances administered often among such a widely-scattered body of settlers. There was, however, an English clergyman who had a parish about 400 miles long by 90 wide, and who went about among the different stations and gave Sunday services as often as he could. He was happy to say that those in whom he was especially interested had a regular service every Sunday. The rev. gentleman concluded by remarking that there were two things which were in great demand among the settlers, and which if imported would meet with a large sale—namely, cheap fencing and grass-seeds.

On the motion of Mr. CONGREVE, of Peter Hall, seconded by Mr. CHEFFINS, a vote of thanks was accorded to the Rev. E. Smythies for his lecture; and thanks having been afterwards voted to the chairman, the proceedings terminated.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

LECTURE BY PROFESSOR SIMONDS ON DISEASES IN SHEEP.

On Wednesday, Feb. 27, the first lecture of the season to the members of the Royal Agricultural Society was delivered by Professor Simonds, in Hanover-square, on "Some of the Causes which Produce Disarrangement of the Digestive Organs in Young Sheep." There were five members of the Society present, out of these Mr. Ramsay, of Newcastle-upon-Tyne, took the chair. After some routine business had been disposed of,

Professsor SIMONDS said: Mr. Chairman and Gentlemen,—In directing your attention to the subject of this lecture, namely, "Some of the Causes which Produce Disarrangement of the Digestive Organs in Sheep," it may be as well perhaps that I should in the first instance make a few general observations with regard to the digestive system of this animal. Every gentleman present is perfectly well aware that in speaking of sheep we speak of animals belonging to that class which are designated *ruminantia*—that is to say, animals that have a very complicated system of digestive organs, and which are in the habit, after having received a certain quantity of food, of passing that food back from the stomach to the mouth for the purpose of its being re-masticated and re-insalivated. Subsequently to its being thus mechanically reduced and fitted for digestion, the food is returned to the rumen, and then passed on to the true digestive, or fourth stomach. We have, first, the rumen or paunch, into which the food goes primarily; next the reticulum, or second stomach; then the third stomach; and, lastly, the fourth, or true digestive stomach, the others being in fact preparatory organs. It is unnecessary that I should go into such disputed questions as to whether the food is passed directly from the rumen into the mouth, or is previously passed into the reticulum, and then into the mouth; or whether, on its second descent from the mouth, after being re-masticated, it passes into the rumen, or directly into the third stomach. These are matters of abstruse scientific interest, into which we had better not enter on an occasion like this. I may, however, state that I hold the opinion that the food is passed first into the rumen, and that, at each subsequent swallowing of that food, the matter, however it may be reduced, is still passed into the viscus; and the reticulum is nothing more nor less than a supplier of thoroughly masticated and insalivated food to the third and fourth stomachs, that it may be properly digested. When the food is passed from the fourth stomach it goes into the intestinal canal, and there it becomes subject to the action of certain secretions, which may be said to assimilate or produce that change in it by which the nutritive parts are separated from the others. Subsequently to their mingling with the crude mass which comes from the stomach, the chyle (the nutritive parts) is precipitated unto the mucous membrane of the intestines, where the process of absorbing this nutriment goes on. The feculent or innutritious matter passes into the large intestines, where it is retained for a certain length of time, and subject to the further absorption of any nutritive parts which it may possess. Ultimately it is voided by the rectum in the shape of small nodules, which are compressed into that form by the action of the gut during the passage. It was necessary that these observations should be made, because, as you will see presently, we have the diseases to which I shall specially allude, namely, the affections which are commonly known by the term diarrhœa, centred mostly in the intestinal canal, and having their origin in material, which may be to some extent acrimonious, coming in contact with the lining membrane of the canal. But not only have we causes of that kind affecting the consistency of the feculent matter, and the amount of nutriment extracted from the food of the animal, but we have also very often an irritable condition of the bowels, produced by causes not acting directly on the intestinal canal. Indirect causes frequently produce fatal cases of diarrhœa in sheep, particularly in young sheep; and it is therefore important to be able to separate the one cause from the other, and to ascertain whether the cause is one which is acting directly or indirectly on the intestinal canal. In the first instance, I may remark, if we look at very early lambs, we frequently find losses occurring to the owners from their being affected with what farmers term "white scour." As practical men you are perfectly aware that when lambs are perhaps not more than four or five days old, there will be an exit of liquid evacuations, which are exceedingly sour, and which to some extent even excoriate the parts they come in contact with; and these evacuations being of a pale colour, the disease is ordinarily designated by the words "white scour." We have to inquire upon what this white scour depends, and I think we shall see that it frequently shows itself under certain circumstances, and very rarely indeed under the opposite circumstances, For instance, if we look at the causes which operate in the production of a mischief of this kind, we shall generally find that it happens when the ewes are remarkably well fed. It is very seldom indeed that we see this disease when the ewes are being fed on ordinary grasses, or even receiving only a moderate supply of turnips. We know very well that ewes sometimes have to produce their lambs on turnip land, depending upon the nature of the soil, the character of the farm, and the system of husbandry pursued. Take the ordinary case of ewes lambing upon turnips, where they are supplied with a very large quantity of good turnips, and at the same time with a considerable amount of what we designate highly-nitrogenised food in the shape of oats, peas, or oilcake, the object of the individual farmer being to fatten his ewes and his lambs together. This is a system which used to be followed to a certain extent in Middlesex. A farmer purchased a small quantity of ewes; they lambed on turnips; he supplied them with a large quantity of cake and corn in addition to their turnips, and gave them hay and chaff; and, under these circumstances, he found that, although he got his ewes into good condition very easily, and could get rid of them in the latter part of the year as fat ewes, yet he lost a large number of lambs from the affection which is designated white scour. This will help to explain what I believe to be the real cause of this affection—namely, that there is a peculiar condition of the lacteal secretion; that is, the milk of the ewe, induced by this highly-nitrogenised food, being in excess. In order to make this a little plainer, I may just remark that the milk of the newly-parturient animal is rich in an animalised product which we call *colostrum*. If, for example, we examine milk very shortly after parturition, we shall find that in addition to the ordinary fatty globules which exist in such large numbers, there is present a considerable quantity of cells of large size filled with granular matter. On the condition of these cells will the colour of the milk depend. If they are present in large numbers, the milk will have a yellowish-brown appearance; while if their number is small, the milk will be of the ordinary colour. Now, in the ordinary state of things, these cells of *colostrum* very soon disappear, and they are met with very sparingly indeed in milk a few days after parturition. If, however, parturient animals are kept too well, to use a homely phrase, there will be a prolongation of the period for the retention of these cells, and in consequence a cause is brought into operation which, when the milk is partaken of by a young animal, leads to its not digesting the milk precisely in the same manner as it would do were the cells not present. It has been said that these cells exist in the milk, that nature may furnish her own purgative to a young animal, the bowels of which are loaded with a peculiar substance, which is called *meconium*. I mention this because I wish to remark that there can be no doubt that milk which is rich in *colostrum* has a laxative effect on the intestinal canal. But it is not simply to the laxative effect of this material that I look for an example of an animal becoming affected with white scour. We must regard these cells as agents which absolutely excite fermentation in the milk; and there can be no doubt, I think, that lactic acid in excess is thereby produced, so that when the milk is received by the young animal there is a more than ordinarily firm curd produced in the stomach. You are well aware that if a young animal partakes of milk—and at this period it partakes of nothing else—that the milk (that is to say, its caseine) is acted upon by the gastric juice, and that the first effect of digestion is the coagulation of the caseine. But after a short time the same cause acts upon the coagulum thus produced, and it is broken up or otherwise digested. Now, if you have an abnormal condition of the milk itself produced by a cause of this kind, you will find that when the clot is produced in the stomach of the young animal the gastric juice is not solvent enough to break it up; so that it becomes an indigestible material, often accumulating to the extent of three or four pounds weight. The whey of the milk is passed through the intestinal canal, and is voided with the mucus of the intestines as an abnormal secretion and comes from the intestines in the form of a white fluid. I have seen many young animals fall a sacrifice to this state of things, because not merely had they functional derangement of the stomach and intestines, but absolutely inflammation of these organs. The animals then die of gastroenteritis, induced by causes of this kind. With regard to the means at the disposal of the farmer for getting rid of the affection, knowing what has led to it, of course common sense would tell him to alter the management of his ewes; and everybody who knows anything practically of this matter must be aware that you can hardly do anything that will be beneficial to the lambs without paying attention to the health and food of the ewes. Let the nitrogenized food be lessened in quantity, and the animals be differently managed generally with respect to their food, and especially cease to use cake and corn for a certain time, and then you will find fewer cases of this kind occurring. Thus you will strike at the root of the evil at once. Something might be done also with regard to the lamb. At that time, it may be remarked, the system of the young animal is ill adapted to bear up against disease, so that necessarily a great many fatal cases will occur. But the object of the farmer must be first to remove the cause itself by preventing the animal from taking any more milk for a day or two. There is a difficulty, however, arising here. How is the animal to be supported? Support is necessary at this time; but it should be given in the form of well-boiled oatmeal gruel, and so on. The lamb should be taken from the ewe for the day, and then it should be supported with diet of that description. Ant-acids should be given to it, particularly bicarbonate of potash, which will have a tendency to break up the firm coagulum of caseine in the stomach; and if that be combined with a little gentle aperient and carminative medicine, the case may not be unsuccessfully treated. I do not know anything better than such a mixture. Perhaps as good a one as can be given to the lamb for a day or two while it is separated from the mother is a scruple of bicarbonate of potash, with about 10 grains of rhubarb and from 5 to 10 grains nutmeg. Give this with a little peppermint-water or gruel once or twice a day, and with such management as I have indicated the result will generally be to arrest white scour. I have dwelt on this because it is a matter of importance, and because I am inclined to think that this is an affection depending exclusively on the causes to which I have referred, and that it is one of those diseases which are easily prevented. I pass on to speak of other deranged conditions of the digestive system which lead to diarrhœa in young sheep prior to weaning. We have, of course, to consider the manner in which the animals are managed. I have already intimated that the management must to a considerable extent be influenced by the system of farming. Now, taking ewes upon turnips again, and supposing that the lambs are getting on strongly, the common practice is to use what are called lamb-hurdles, by means of which the lambs can run out of the fold on to the turnips, and return to the ewes at their will. If under circumstances like these a farmer is constrained to put his flock upon turnips, having a large amount of top quickly grown, and which may be said not to be perfected, it frequently happens that he loses some of his lambs from diarrhœa. On the other hand, if there is an advanced ripening of the turnips, the weather having been genial, and there having been scarcely any wet, then you will find the animals do remarkably well. Particularly is that the case if the turnips run up so as to produce their flowering stems. Every farmer knows that lambs can crop turnip tops when in flower, not only with impunity, but with very great advantage. On the other hand, if the turnip-tops are immature, or only partially developed, or if the weather is wet, we find that food of this kind, given as it mostly is in great abundance, will act as a direct irritant upon the mucous membrane of the stomach and the intestinal canal, and diarrhœa be the result. Occasionally this functional derangement of the intestines leads to a partial attack of *gastro-enteritis*—in other words to inflammation of the mucous membrance of the intestinal canal, and the young animal soon falls a sacrifice to the scouring. With regard to cases of this description of diarrhœa we can see readily enough that we have only to alter the system of management, by limiting the quantity of green immature tops that are given to the lambs, we have only either to supply them with a smaller quantity of tops or to substitute some other food, for them to get rid of the evil. It is, perhaps, an evil of a minor kind in connection with the rearing of sheep, because, speaking in general terms, I may say we know that at that period of the year it is very rarely that we find turnips in this particular condition. But on certain soils and in certain states of the weather it will occasionally occur, and, of course, losses result as far as the lambs are concerned.

To go a little beyond this, you will observe that after weaning a large number of young lambs are lost; and from precisely the same cause, namely, diarrhœa. Now, here we frequently find that several causes are brought into operation, some of these being unquestionably of the same nature as those to which I have already alluded, and others of a totally different kind. I will now say a word or two with regard to the ordinary causes of the same nature as those which I have mentioned. I would first remark that if lambs are placed on clover or artificial grasses, and if the weather at that particular time of the year, as is likely to be the case, is not only elevated in temperature, but marked by the mixture of a great deal of watery vapour with the atmosphere, the animals if they are eating green succulent vegetable matter in large abundance, particularly in an unripe state, will become affected with diarrhœa; and no system that can be adopted unless we alter the management or feeding of the animals, will be sufficient to stay an evil of this kind. But we have this affection often induced by another cause. It is not, perhaps, so generally known as it ought to be, that clover especially abounds in a large quantity of vegetable hairs; that the stems of broad-leaved clover, and in particular the under and upper parts of the leaf, have a large number of vegetable hairs upon them, and that these are very apt, when received into the stomach, to become agglutinated and to be rolled into a ball-like form within the rumen. So long as substances of this kind remain in the rumen or first-stomach it is a matter of no consequence whatever; so long as they are confined to the second stomach in common with the first, it is also a matter of little moment; but if these substances pass, as they are very likely to do, into the third stomach, or rather I should say through the floor of the third stomach, directly into the fourth, they often become offending agents to this organ, and not unfrequently pass on half-digested thence into the intestinal canal. I do not mean to say that there are very many cases of diarrhœa which are attributable to causes of this kind, but we not unfrequently find a diseased condition of the fourth stomach, and especially of the small intestines, induced by the presence of these bodies. These substances are similar in form to the hair-balls which are frequently found in the stomachs of fatting calves, but they are in fact of far greater moment, in connection with the disease in the digestive organs, in the case of young sheep than in that of other young animals. A hair-ball in a young calf very rarely indeed produces any mischief, unless it be passed or attempted to be passed into the mouth again, to be remasticated, in which case it will often happen that an animal will be choked. In the Museum of the Royal Veterinary College there are specimens showing young calves to have been choked by hair-balls. The chance of choking does not depend upon hair which is deglutated, or attempted to be deglutated; but the evil actually occurs from the hair as a ball passing upwards from the rumen. These vegetable hair-balls can only be detected on a *post mortem* examination. I am not aware of any diagnostic symptoms by which we can dive into a case of that kind; it is only through a *post mortem* examination that one can tell that an animal has suffered from such a cause as this. It is frequently said that lambs die from wool-balls; that is, I know, a common idea among farmers and shepherds. But wool-balls are not to be confounded with vegetable hair-balls. The two are produced in a similar manner—that is, by the matting together of the wool or hair; but hair becomes matted much quicker than wool, and it is only when the animal is living on clover, and particularly broad-leaved clover, that hair-balls are found present to any great extent. Now, besides this cause of derangement of the digestive organs—the feeding of animals on clover and grasses at this particular period—is just the period when we find also a large loss of lambs to arise from diarrhœa as symptomatic of a diseased condition of the lungs. In investigating this disease it is always necessary to endeavour to understand upon what the symptoms really depend. For want of this we frequently find a person saying, "I am losing a large number of lambs from scour;" and he believes that this arises entirely from something that disagrees with the digestive organs of the sheep, or that some disease exists in those organs with the nature of which he is unacquainted. When you speak to him further on the subject he will say, "I have changed the food of my animals; they died upon such and such a food, and I put them upon food of a different character; they were upon artificial grasses, and I put them upon natural grasses; they were upon clover, and I put them upon artificial grasses instead of clover. I have given them corn, peas, and so on, what is commonly called dry food; and though they will not eat much dry food, which is not to be expected when they can get green and succulent food at this time of the year, nevertheless I find that a lax state of the bowels is as prevalent among them now as it was a week or two ago." If you ask this man—"Have you noticed whether your lambs are coughing?" he will reply "Yes, I have found them coughing very much, and I have observed that the coughing preceded the diarrhœa." This he will say, though he may know very little about what the coughing depended upon. Now I may remark that this form of diarrhœa is really due to the presence of entozoa within the bronchial tubes of the lambs; that in the disease of the lungs it is produced by the existence of these entozoa, and that the diarrhœa is but symptomatic, coming on as one of the last things in the break up of the animal machine. We know that in several affections of the lungs in sheep or other animals the disease is often accompanied with diarrhœa. In cases where there has not been a healthy and perfect decarbonisation of the blood, from structural disease of the lungs, diarrhœa often results. Take, by way of illustration, that disease which in the human subject is known by the name of phthisis. It is well-known that some persons who are attacked by this disease have diarrhœa, and when the disease tends to a fatal termination the diarrhœa becomes very copious, and that life is sometimes sacrificed through the depression of the animal powers, thus produced. Nevertheless the origin of the diarrhœa is disease of the lungs, which prevents them from performing their proper functions, and thus prevents the proper decarbonisation of the blood. This accounts to some extent for the presence of diarrhœa in sheep. Now, this filaria bronchialis is a worm, which I am justified in saying is somewhat on the increase. We can readily understand why it should be so, for although we really may know very little of the natural history of the worm, or the best means at our disposal of getting rid of it. We can see that if one flock is affected, that will probably lay the foundation for other flocks becoming affected on the same farm, and that if sheep so affected pass from one farm to another, there will be a wider spread of the evil, and the sheep pastured on a second farm will suffer in turn. So long as we are unable, through studying their natural history, to get rid of these worms before they pass into the organism of the sheep, so long shall we be contending with a disease which is in reality our master; and we may therefore look for a great increase of cases of this kind. With regard to the circumstances which favour an attack, it is rather remarkable that there are far more cases of this description occurring on wooded land, parks, and so on, than in open fields and what may be designated light-land districts. There is no immunity; but sheep kept in open light-land districts are far less frequently attacked with this disease than sheep kept in enclosed spaces, and particularly sheep which are kept at that particular period of the year already alluded to in parks. With reference to the worm itself, it would appear that even if only one or two of the worms find their way into the bronchial tubes that would be quite sufficient, they being of different sexes to lay the foundation for extensive disease of the lungs. They lay this foundation by travelling as far as they can through the bronchial tubes (which are continuations of the windpipe) into the very air-cells of the lungs, where they deposit their ova. As the result of that deposition of ova, which may be said to be in myriads, irritation is set up first in the lining membrane of the air-cells, which extends to the perenchyma of the lung. The lung then undergoes a peculiar change: it becomes altered in colour, it will sink in water, and it is altogether destroyed in many parts as an aerifying organ. This often takes place particularly on the fringe or edge of the lung, but not unfrequently in other portions. The brood of young worms is hatched absolutely in the bronchial tubes and in the air-cells of the lungs; so that the large quantity of these worms which are frequently met with in the bronchial tubes did not enter from without, but were produced within. One or two parent worms finding their way into this organ suffice to produce an immense amount of mischief. These creatures may, so far as their immediate development is concerned, be termed ovo-viviparous—that is to say, a great number of eggs will be thrown out as eggs; but frequently the young worm will escape from those eggs while yet within the parent. In making a section of a lung, taking the smallest possible quantity on the point of a scalpel, just sufficient to soil a piece of glass, you will see, in a space of the size of a drop of water, millions of eggs just hatched; and if you examine an old worm, you will see eggs in all stages of development; so that she brings forth her young in a living form, and also in the form of eggs more or less mature. Now, one worm will produce—if I were to use figures here I should have to speak of billions, and even of trillions—an immense number of eggs, and we can therefore easily understand how a vast amount of mischief may be done, even by one or two worms. But now the question arises, How did this one worm get there? Where does the parent worm come from? We must repudiate the theory of fortuitous generation. I no more believe in the fortuitous generation of a worm, or of the lowest form of animal life, than I believe in the spontaneous origin of myself. We must look for other causes. And here we have opened to us a vast field of investigation, and one which may be said to have been as yet scarcely entered upon. I have experimented again and again with this class of worms which are designated by the name of nematoid or hollow worms, and in every experiment I have failed to produce them within the windpipe. I would, then, throw it out as a probable cause of their existence, that a great number of the ova are expelled in the coughing of the sheep with the mucus which is coughed up. Large numbers are, I believe, expelled at each coughing, mingled with the mucus; and I would just hint at it, as a probable thing, that these ova come to maturity to some extent externally to the sheep; that certain plants—it may be ordinary grasses — become the habitat of these creatures in an immature form, and that in this condition they are taken into the organization of the sheep, and as each entozoon has its own particular locale, these creatures very soon find their way into the windpipe, and a very few doing so are productive of immense mischief. Now, I am inclined to believe that this is really the means by which their presence is to be accounted for. We cannot for a moment suppose that all the worms which we meet in the lungs, for example, under circumstances of this kind can have entered from without. We cannot suppose the explanation to be that the ova floating in the atmosphere are, after they have become somewhat dry, received into the respiratory organs, and there become matured. There are some things which appear to me to militate strongly against that view of the matter. I have, for example, broken up many and many an old worm when yet alive. Having thus procured eggs in various stages of development, I have placed them in different kinds of fluid, none of which could interfere with their vitality, and have in this manner brought them in contact with the nostrils of sheep. Not only have I done that, but I have used a thick mucus, like gum water, putting into it a number of living worms, as well as a large number of ova, and have administered this very slowly to sheep, so that it might hang round the mouth, and the worms might travel down the windpipe; but, singular to relate, in all these experiments I have failed. Knowing that nematoid worms are perfected to a certain extent out of the organism, I have been led to the conclusion that, it is not improbable—I do not say it is positively the case—that the ova themselves are the real cause of the mischief; that, being expelled in the manner I have mentioned, they become parasitic to some vegetable matter, and, being thus taken into the sheep, produce disease. This would explain why, if you put fresh sheep on a farm where the worm affection has existed, those sheep become diseased, and the evil continues year after year. We know that weather often has an influence by rendering animals more susceptible; and we know, too, that particular systems of management have an influence; but we are now looking at the matter in an abstract point of view, and I throw out the hint that this may be one cause of the increase of the disease. I might extend my view with regard to worms. There is a large number of worms which affect sheep in particular, some occupying the true stomach itself, under the influence of which sheep will die in a dropsical condition. Under all circumstances and conditions, and at all ages, there are scores and scores of sheep at this moment being lost from this cause. There is no diarrhœa in a case of this description. Within the last few days I have received some worms of exactly the same class as these which were found in wild rabbits; and I believe that the worm which is found in the stomachs of sheep is one that exists in other creatures, and it may be common to half-a-dozen kinds of animals. One word with regard to the means which we have at our disposal for getting rid of this disease. You will understand that I am speaking of the lax condition of the bowels as being symptomatic of lung affection. I say that in this instance diarrhœa is not a disease which affects the alimentary canal; therefore our object must be not to give astringents. No change of food, no medicine or anything of that kind, having that object in view, will produce any benefit at all. We must endeavour either to get rid of the worms as they exist in the trachea or in the bronchial tubes of the lamb; to root out the disease which they have produced within the lungs. The best thing we can do is of course to attempt to get rid of the worms themselves and destroy the broods as they are following one another; and we can effect their destruction only by getting the sheep to inhale a medicated atmosphere. Perhaps, however, I should not say "only," because it is well-known that there are certain worm-destroyers which can be given to sheep, be quickly diffused through the system, and be found beneficial in destroying these worms. But these anthelmintics are often powerless, and the losses are just as great, so that after all we have to come back to a medicated atmosphere, and I know we can do that with great facility, safety, and advantage. If we take the sheep and place them once a day, or perhaps once every other day, in a shed, and so arrange the shed that we can get the animals to inhale the fumes of burning tar in which we cast sulphur from time to time, and thus impregnate the atmosphere with sulphurous vapour, we shall find that we destroy, probably not the parent worms, not the natured worms, but a very large number of those which have been recently hatched. I do not suppose that we have any influence over the ova as ova, but we have considerable influence over the young worms; and I believe also, to use a homely phrase, for this has been observed to follow, that we give a "notice to quit" to the old worms. We make their habitat rather untenable to them, and the result is that they are inclined to quit the body, and so we get rid of some of them in that way. Then, if we strengthen the constitution of the animal by generous diet, we shall frequently find that we can save a large number of young sheep which would otherwise be lost. Here we may take such an agent as turpentine in conjunction with a little balsam of sulphur and a little oil, and I do not know that we can have a nicer anthelmintic. Turpentine, although a diuretic, is found to be got rid of in the animal system to some extent through the medium of the respiratory organs. It is an agent which becomes quickly diffused throughout the system of the animal that takes it. Even the breath of the animal will be affected by it; and the same is the case with the milk and other secretions. It acts powerfully on the kidneys and on the mucous membranes of the lungs, and it is an energetic destroyer of entozoa; so that persons may give turpentine, in conjunction with the old-fashioned balsam of sulphur and a little oil, from day to day, with considerable advantage, to their lambs. This must be followed by the use of sulphate of iron in the food of the animal, with corn diet; and then much benefit will be found to ensue. On the subject of parasites, we also find, particularly in the situations to which I have referred, the presence of intestinal parasites, which are the cause of the direct irritation of the mucous membrane of the alimentary canal, and are necessarily associated with diarrhœa. There are two forms of worms particularly, which inhabit the intestinal canal, and lay the foundation for diarrhœa. One of them is a worm which is called, from the peculiarity of its formation, the tricocephalus, or hair-headed worm. It is very common to many animals besides sheep; but, among domesticated animals, it exists to a greater extent in sheep than in any other creatures. These tricocephali are very often a great source of mischief. They burrow their heads into the mucous membrane, and exist more particularly in the cæcum and colon than in any other of the large intestines, and but very rarely in the smaller. Dwelling there, and producing an irritation of the intestinal canal, we can easily see that they would cause the hurrying on of the contents of the intestines, and that diarrhœa would, in fact, result from the local irritation. These worms are with great difficulty diagnosed—that is to say, looking at the sheep, we cannot at first say whether they are or are not the cause of diarrhœa. If, however, a large number of sheep are affected, and a good deal of mucus is discharged with the alvine evacuations, if all ordinary means of arresting the diarrhœa fail, and if the animals, although wasting, nevertheless have a tolerably good appetite, we may come to the conclusion that the diarrhœa is due to the presence of worms; for, as a general rule, when worms exist in the intestines of almost any animal, there is rather an increase than a diminution of the appetite. Generally speaking, when we effect the expulsion of the tricocephali, they come away in a mass. They have a peculiar liking for each other; for no sooner do they quit their hold of the mucous membrane of the intestinal canal, than they run together, thus producing a large lump, or mass. In this way they are usually expelled; and it is with difficulty that you can separate one of these long-necked worms without breaking, in consequence of its neck being twisted in all possible directions with that of others. Another kind of worm, not so well known as the tricocephalus, but also the cause of diarrhœa in sheep, is the one which we designate sclerostoma, hard-lipped or hard-mouthed worm. This also exists in the large intestines, attaches itself by its sucking disc or mouth to them, feeds on the juices of the animal, and lays the foundation for diarrhœa in the same manner as the tricocephali do. Very frequently these two kinds of worms co-exist in immense numbers, and I myself have taken great numbers of both from the same animal. Now, before throwing out a hint as to the best means of getting rid of these, and thereby striking at the foundation of the irregular condition of bowels arising from that cause, I will refer to other worms which are present in the intestinal canal, and about which persons are exceedingly solicitous; I mean tapeworms. They are more particularly common in lambs than sheep. They often exist in large numbers, and I have seen as many as a dozen or so in the intestines of one animal. Speaking in general terms respecting tapeworms, their natural history is pretty well made out. They are, in fact, the perfect entozoa arising out of the hydatid, those peculiar bladder-like bodies which are met with in different parts of the organism of various hydatid animals are nothing more nor less than the scolices of tapeworms. I believe that the dog is infested with something like seven or eight varieties of tapeworm, and with one exception I believe the whole history of the tapeworm is known. In common with Dr. Cobbold, I have for some time been engaged in investigating the development of this class of entozoa, and I have by me, as Dr. Cobbold has also, tapeworms produced from various hydatids which have been given to dogs, cats, and other carnivorous animals. We have them at various ages. We gave the hydatids to the dog, and killed him within a certain number of days, and found the product of the hydatids present. And so we followed the development of these creatures from time to time. I merely refer to these experiments in order to show that we know something pretty certain with regard to the tapeworm, but little as to the nematoid worm; for as to how these tricocephali and sclerostoma get into the intestines and increase in number, all we know is that they are oviparous, perfect male and female, and beyond this we know nothing. It is a remarkable thing. Take some of the large intestinal worms, by way of illustrating this point. You have seen in the horse and in other animals a large worm, nearly a foot in length, very like the earthworm, but white in colour. We call it, because it is like the earthworm, the lumbricoid worm. I have a specimen in my possession of a pig's intestines, with worms in it six or eight inches long. There are not less than between two and three hundred crammed into the intestines, though the pig was only six weeks old, and the worms were developed to the size of an ordinary quill. I have other worms, taken from dogs only three weeks old, and these worms, though they are not lumbricoid, are fully matured. In fact, they had been perfectly formed in that short space of time; but, strange to say, though you find them of various sizes and of perfect form, you never find a young one as the immediate product of these parent worms. Here is an egg, which is not visible to the naked eye: that egg has to produce a young worm, which is to be developed somewhere; yet we never see them in such a form as that we are able to say that it is a young lumbricoid worm. We know nothing about them; but here is this fact, that if you take one of these worms, cut it up, put it in a jar of water, allow it to remain there for ten or twelve months, and then examine the deposit at the bottom, which has the appearance of so much decomposed matter, you will see the young worms beginning to exist in the eggs, and not before. Their vitality is preserved. They undergo a subsequent change. The young worm is produced; it becomes parasitic, and enters the intestines and stomach of the animal. So that in reality we open up a vast field of science—one that will amply repay an individual for cultivating it, but which will require a life, or two or three, to make anything out of it at all. With regard to getting rid of these intestinal worms as a cause of diarrhœa, I believe that great benefit would result from the daily use of salt. Even though the lambs are scouring, and salt is otherwise objectionable, a certain quantity of salt mingled with ordinary food will be found effectual in arresting diarrhœa. Besides that, advantage will result from the more direct anthelmintic agents. Let balls, which are preferable to draughts, be made of Venice turpentine, with sulphate of iron and some gentian. Give them to the sheep, and you will find that you bring away these *tricocephali* and *callus-tænia* in very large numbers. Then, having got rid of this cause, ordinary attention and dry food will be effective in restoring the health of the animal. But besides these as causes of diarrhœa in lambs, we have other causes that are occasionally brought into operation, but which are precisely the reverse of some of those to which I have referred. Sheep suffer less in this respect from what we may call an excess of indigestible woody fibre of vegetables than any other animals. I will illustrate that in this way. We will suppose that a man has a number of young weaning calves, or under a year old. He is rather niggard. He has heard a great deal about the nutritive properties of straw, and he thinks fit to give the animals an excess of straw, to have it cut into chaff, and supplied to them in a rather large quantity. I know what will be the result. He will have a certain number of cases of diarrhœa, and occasionally sustain severe losses in consequence. That diarrhœa depends upon the direct irritating effects of the ingesta upon the intestinal canal. It is a material that is not properly digested and assimilated. The fact is that straw is straw, and that you can make nothing else out of it.

Professor Voelcker: Yes, paper (a laugh).

Professor Simonds: True; but I am speaking of what is made of it when it gets into the intestinal canal. You may rely upon it that a very small quantity of blood will come out of it; whilst there is a great deal of indigestible material in it, which acts as an irritant on the intestinal canal, and produces diarrhœa. Sheep will now and then suffer from similar causes. If a man gives too much chaff to his sheep, and too little corn, or if he withholds a certain quantity of green and succulent food at the commencement of winter, there will be frequent cases of diarrhœa. The same amount of mischief, however, is not produced in sheep as in cattle, because sheep, though ruminating animals, gather their food in a somewhat different manner from oxen. They take more pains, in short, in masticating their food than the ox. Hence, when sheep are upon pastures, we see them feeding very closely, and masticating every mouthful for a longer time than oxen. The ox swallows his food in a mass. Chaff is partaken of in the same manner. In these circumstances a change of food becomes necessary, and by this means benefit results. It is not necessary to give astringents, because they do not strike at the root of the evil. Remove the cause then, and the effect will follow. Now, not only these several causes, and a number of others to which I have not referred, are productive of mischief, but diarrhœa is also very often symptomatic of other diseases. We have diarrhœa due not only to the active inflammation of the mucous membrane of the alimentary canal, and to the existence of parasites, but not unfrequently to other separate and distinct diseases. If I wanted the best illustration of this which science affords, I should direct your attention to the circumstance of sheep becoming affected with the malady which we term cattle plague. Here we have a disease which in the sheep is invariably, I believe, associated with dysenteric purging. Hence, we get an apt illustration of morbific matter carried into the organism of an animal, and so deranging its entire system, as to lay the foundation of a fatal attack of diarrhœa. I have thus thrown out a few hints with regard to some of the causes which produce derangement of the intestinal canal, and I know I have done so very imperfectly. I will only say, in concluding, that among our most useful astringents for arresting diarrhœa are galls. Next to the use of astringents stands the neutralisation of the acid secretions which come from the mucous membrane of the alimentary canal in all cases of diarrhœa, without reference to the causes that may be existing to produce the diarrhœa, by means of ant-acids, particularly bi-carbonate of potash, which is a most effective agent. If we feel a disturbance or a lax state of the bowels coming on we shall frequently find that by abstaining from food and taking a good bold dose of carbonate of soda the complaint will be checked at once, for the simple reason that the carbonate neutralises the acid secretion which exists under the circumstances even without reference to the causes which have given rise to the diarrhœa. With these remarks I conclude my lecture.

The Chairman asked the Professor if he had ever analyzed the hair-balls of which he spoke?

Professor Simonds had only examined them microscopically. They were composed entirely of vegetable hairs; in other words, the mucus of the intestines glued the hairs together, and converted them into a species of felt.

The Chairman, in reference to tape-worms, said he saw one which came from a dog of his, last summer, and which was 24 feet in length.

Professor Simonds: In oxen these worms attained an extraordinary length. True, they were not common to the ox, but he had seen them come from that animal double the length to which the chairman referred. The worm known as the tænia elongata in sheep, was so designated in consequence of its immense length.

The Chairman said there was a disease existing among sheep about twelve months old bred in the mountains. It was known by the name of "the sickness." These sheep lived on coarse food and experienced a good deal of wet and cold; and the loss from this cause was very severe in the hilly districts of the north. When he was amongst the hills some time ago he advised the farmers to give their sheep peas, beans, and things of that sort, and the farmers now said that he was the best doctor they had ever seen. The sheep were affected with diarrhœa to a very great extent. He observed that Professor Simonds had not referred to the quantity of milk taken by young lambs. His own impression was that they took a great deal too much, more indeed than their delicate stomachs could well convert into food. Sheep that were highly fed gave a good deal of milk, and their lambs seemed to be more liable to disease than those of sheep which were lean and yielded less milk. Had the Professor noticed that?

Professor Simonds replied that he had, and was inclined to think that lambs which had the opportunity of going to their dams as often as they liked would rarely be found to glut themselves. It was not because the animal had taken a glut of milk that they got these large accumulations of curd. In reality it was often seen that when an ordinary quantity of milk had been taken the curd accumulated in the stomach.

The Chairman: With regard to the digestive condition of milk, it was generally believed that rich milk was easier of digestion than weak.

Professor Voelcker desired to make a remark or two on the question as to how far food of the same description—for instance, turnips or grass—at different periods of their growth affected the health of cattle, by producing either constipation or diarrhœa. There was a very great difference in the practical effects which food of the same kind produced. He believed that the land on which the food was grown had much to do with the quality of the produce. For he knew practically that there were some soils which invariably grew produce that was termed "scouring food." Such were the scouring lands of Somersetshire, which lay upon the lias, and almost invariably had the effect of producing diarrhœa. In some seasons this was more the case than in others, and it was remarkable that in hot summers the land became more scouring than at the colder periods of the year. It has been observed that the period most dangerous to the sheep was when they were put on clover or natural grasses at the time the grass and clover were making a rapid growth. Thus, when warm weather set in suddenly, after much rain had fallen in the early part of the year, there was a rapid development of leaf, and the produce became very sour. He believed that the cause of this was not merely attributed to the presence of much water—an opinion entertained by practical feeders, who thought that the food was merely too watery and on that account produced scour. In his opinion it was also due to the imperfect condition—the want of elaboration in the crude juices of the plant. Having examined that subject he had constantly found that a large amount of crude nutritive matter was present. It was not the case, as was sometimes maintained, that unripe food contained a deficiency of nitrogenous matter. The very reverse was the case. If the food were too rapidly grown they would invariably find much nitrogenous matter in it, but not in the form of albumen, of caseine, or of any definite chemical compound which was known from actual experience as the feeding matter that produced flesh. They found it, he could hardly say in what condition, but he could tell them in what condition it was not. It was not as nutritive albumen, or as nutritive gluten, or in any form which was commonly designated flesh-producing. He concluded then that it was unelaborated crude feeding material. Then there was also present in this rapidly-developed young produce a very much larger proportion of saline matters which were taken from the soil, and were evidently stirred up in the plant, to serve afterwards in the assimilation of atmospheric food and its conversion into sugar, gum, and other nutritive substances. This unelaborated matter and this excess of saline or mineral substances, often abundant in clay, had a tendency to produce a laxative effect upon sheep, and oxen also. There was another reason probably why immature food and food which was given in its earliest stages of growth, like very young clover, had this effect. In very young produce there was invariably a much larger proportion of vegetable acids present than in riper produce; and these organic acids no doubt had a medicinal effect when taken internally. There they were converted into sugar and became real nutritive matters. He would observe further, in speaking of these organic acids, that there was a great difference in their character. In the earliest stages of their growth or first development an acid was produced which gave way to another organic acid very similar in its composition, but different in its effects on the living organism. Thus in very young rhubarb, and in a variety of other plants, the acid to which he alluded (oxalic acid) was not confined to rhubarb stems, but occurred as perhaps the most common and widely circulated acid in the vegetable organism. Within a week after detecting the oxalic, which he need hardly say was a deadly poison, it would go away in the form of citric acid—a similar composition, but a different material so far as its effects were concerned. The citric acid was then changed into malic acid. So that one acid changed into another, until finally they disappeared, or became neutralized by the very materials which were accumulating in the vegetable organism. The result of these chemical changes in the ripening of the food—changes which had not yet been investigated so minutely as the importance of the subject deserved—was that the food became totally different in its practical effects. In corroboration of what he now said, he might remind them that very early in the season it was an extremely dangerous thing to eat much rhubarb pie. When the rhubarb became plentiful and cheap, then he ventured upon it—not because it was cheap, however, but because he knew that by that time the oxalic acid had disappeared, and had given place to the malic acid—the acid of the apple—or the citric acid, which was extremely grateful to one's constitution.

Mr. Frere considered that the loss of lambs was often hardest to control in the autumn, especially on the richer pastures. He had been informed by a gentleman who farmed good rich grass land in the Isle of Ely that they used to have such losses from scour in his father's lifetime, that they had almost given up weaning the young lambs; but his father being a maltster determined to try malt, and it proved to be of so much service, that it had been employed ever since, without any apprehensions about stocking the land with young lambs in the autumn. Referring to his own flock, he (Mr. Frere) was farming on a dry light land, where he was free from the forms of the malady of which Professor Simonds had spoken, and he experienced no practical difficulty until he arrived at the end of July. Up to that time the lambs would have been weaned on the layers chiefly, and he would have no trouble until they had been over the layers once. From that time, however, difficulties would arise, and careful, vigilant management be particularly required. If the lambs were allowed to feed entirely or mainly over the layer a second time, diarrhœa would inevitably set in. That difficulty, when it did occur, he met in this way: Early in April he put on some early rape on the strongest of his land, which would best bear it in the warmest and driest months of the year. In the middle of July he folded the lambs on that at night, giving them a free range for two or three hours in the day. During this range they would nibble in the layers, which had already been folded over once; but as they chiefly ate the rape in doing so, they did perfectly well so long as the rape lasted. Then, when the rape was gone, his next green crop in succession would be early Pomeranian turnips. He had tried to pull some of these and feed upon the old depastured layer, but diarrhœa set in almost immediately on his adopting that system. He wished to ask the Professor to what cause he would attribute this disease, seeing that in his case it had occurred within a few days of the lambs being made to depend on the foul layer, and that the malady abated directly they were taken off it. Perhaps he might be disposed to attribute it to some form of worms; but his (Mr. Frere's) objection to that solution of the question was that the space of time for which the lambs were on the layer was so short, that there was no symptom whatever of any mischief brewing before they went upon it, and that the malady ceased within a day or two after they were taken off. The layer was Dutch clover and trefoil; the time was the month of July last, and prior to the rains having set in very much.

Professor SIMONDS: The fact was pretty well known that in practice it was not judicious to allow lambs to follow ewes, as it was termed. Generally, in the month of January, the lambs were allowed to go first, and the ewes to follow afterwards. If lambs were constrained to partake of food where ewes had been before them, injury might result to their young organisms from the quantity of feculent matter which would be lying about, and in process of undergoing chemical changes. That would be a source of mischief; but it was further inferred that the land having been manured on the surface, the young herbage would grow up very quickly, and particularly in showery weather. Thus they got an unripe leaf of plant, and this he should consider the chief cause in operation. Indeed, he should look to the manuring on the surface, the rapid growth of the vegetable matter, and its immature condition, as explanatory of the fact, rather than to anything else.

Mr. FINLAY DUN: The same rapid growth, with the like effect, produced on the bowels of sheep, occurred on the richer lands during the spring months. On the better grazing lands of the midland counties they could not keep their lambs without experiencing a good deal of trouble from scour. Very often they died off in large numbers, as described by Professor Simonds, when apparently strong, hearty, and thriving rapidly, from ten days to a fortnight old; and he believed the cause to be that the land was really too strong and the grass too good for them: it was in a rapidly growing state: it was undergoing changes. Probably it was more easily fermented, and so gave rise to a disturbance of the delicate digestive organs of the young animal. He had been very much gratified and instructed by the able and most useful lecture of Professor Simonds. The remarks of the learned Professor in his able lecture were of great value to farmers. Every year a large number of animals were found to be infested with these creatures. The great difficulty was to cope with the malady when the flock was being increased; and the only way, as it appeared to him, of materially lessening it, was by varying the food, and giving a larger quantity of dry food. He might remark, that he had found great advantage, not only in cases of scouring, but also in connection with worms, in giving sheep a small quantity of lime-water with turpentine. He had often advised the use of it, and those who had adopted his advice had told him that that remedy answered better than any other which they had tried. Most persons were too much inclined to rely on medicines, and he agreed with the Professor that, if they looked more to causes, there would be a better chance of arresting the evil.

The CHAIRMAN said he rose with great pleasure to propose a vote of thanks to Professor Simonds for his very able lecture (cheers). He was sure they all listened with great pleasure to his instructive remarks, and those remarks, when they went forth to the country, would, he belieevd, produce beneficial effects. As a practical farmer he quite believed almost everything the Professor had told them; and he agreed with Mr. Dunne, that the only remedy for the evil in question was to endeavour to protect flocks before the disease had got a firm hold.

The motion having been seconded and adopted the proceedings terminated.

MONTHLY COUNCIL, Wednesday, March 6, 1867.—Present: Mr. Thompson, president, in the chair; the Duke of Devonshire, K.G.; the Earl of Powis, Lord Berners, Lord Chesham, Lord Tredegar, Sir J. V. B. Johnstone, Bart., M.P., Sir A. K. Macdonald, Bart., Mr. Amos, Mr. Bowly, Colonel Challoner, Mr. Davies, Mr. Dent, M.P., Mr. Druce, Mr. Brandreth Gibbs, Mr. Holland, M.P., Mr. Wren Hoskyns, Mr. Hornsby, Mr. Hutton, Colonel Kingscote, M.P., Mr. Milward, Mr. Pain, Mr. Pope, Mr. Randell, Mr. Read, M.P., Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Torr, Mr. Wallis, Major Wilson, Mr. Jacob Wilson, Professor Simonds, and Dr. Voelcker.

Lord Tredegar, the Right Hon. Sir John Trollope, Bart., M.P., and David Reynolds Davies, Esq., were transferred from the class of members to that of governors. Hedworth David Barclay, Esq., of Eastwick Park, Leatherhead, was elected a governor.

The following new members were elected:—

Andrews, Onslow, Bradbourne, Ashford
Ardley, Thomas, Long Melford, Suffolk
Barton, George, Totfington, Thetford
Bradley, Alexander, Whepstead, Suffolk
Bromley, Nathaniel W., Basfield Hall, Newmarket
Bullock, Alfred, Chedburgh Hall, Bury St. Edmund's
Bunbury, Sir Charles, Bart., Great Barton, Bury St. Edmund's
Burrell, Robert, Westley Hall, Bury St. Edmund's
Burrell, Walter, Fornham St. Martin, Bury St. Edmund's
Clayton, Eld Edmund, Bury St. Edmund's
Clements, Samuel, Bury St. Edmund's
Coe, Walter, St. Andrew's-street, Bury St. Edmund's
Cooke, Charles Livermere Parva, Bury St. Edmund's
Cornish, George, Bury St. Edmund's
Crowe, Daniel, Gaywood, King's Lynn
Dean, Thomas, Mold, Flints
Dennis, Henry, Hafod-y-Bwch, Rhuabon
Downing, Isaac, Turner's Hill, Rowley, Stafford
Eagle, Alfred, Boxted, Bury St. Edmund's
Freeman, John G., Aspall House, Debenham
Fyson, Edward, Higham, Bury St. Edmund's
Gaudin, Philip, St. Martin's, St. Helier's, Jersey
Gibbs, Charles E., Icklingham Hall, Mildenhall
Gittus, Robert, West Row, Soham, Suffolk
Golding, Thomas M., Walsham-le-Willows, Ixworth
Goldsmith, Harry, Bury St. Edmund's
Goodchild, Robert, Garboldisham, East Harling
Greene, E. Walter, Bury St. Edmund's
Grout, John, Woodbridge
Gwilt, Robert, Icklingham, Mildenhall
Harvey, William, Timworth, Bury St. Edmund's.
Hitchcock, William Henry, Miserden Park, Cirencester.
Hudson, Charles H., Sandall Grove, Doncaster.
Jillings, John, Little Saxham, Bury St. Edmund's.
Jillings, Frederick Viner, Saxham, Bury St. Edmund's.
Jillings, Wm. Harvey, The Nunnery, Bury St. Edmund's.
Jonas, George, Duxford, Cambridge.
Jones, J. Bowen, Ensdon House, Baschurch, Salop.
Josselyn, John, St. Edmund's Hill, Bury St. Edmund's.
King, Arthur, C., Desning Hall, Higham, Bury St. Edmund's.
King, Frederick Wm., St. Mary's Square, Bury St. Edmund's.
Knowles, William, Barton-street, Gloucester.
Le Grice, Henry, Bury St. Edmund's.
Manfield, William, Rattlesden, Woolpit, Suffolk.
Montgomery, Sir Henry, Bart., Maidenhead.
Mundy, Charles James Massingberd, Ormsby Hall, Alford.
Nash, Thomas, Carlton Grange, Newmarket.
Neild, Henry, Worsley, Manchester.
Norfolk, Richard, Beverley.
Nunn, Frederick, Bury St. Edmund's.
Nunn, Frederick, Rougham, Bury St. Edmund's.

Orbell, William, Hawstead, Bury St. Edmund's.
Paine, William Denton, Chevington, Bury St. Edmund's.
Parker, John Oxley, Drinkstone, Woolpit.
Pashley, Alexander William, Tivetshall, Scole.
Patmore, James, Bishop's Stortford.
Pead, William, Bury St. Edmund's.
Rands, Josiah, Ipswich.
Rands, William, Ipswich.
Rayner, Henry, Smethwick, Birmingham.
Reeve, James, Snetterton Hall, Thetford.
Robins, George F., Isleham, Soham.
Rogers, John, Chellington, Bedford.
Roper, S. Craske, Rougham Place, Bury St. Edmund's.
Rudwick, Frederick F., Donnington, Chichester.
Scott, J. Stearn, Lavenham Hall, Sudbury.
Sheldrake, Edward, Ixworth Thorpe, Ixworth.
Shrubb, John Lane, Lymington.
Simpson, John, Buckenham, Attleborough.
Smith, Percy Lionel, Great Peathing Lodge, Lutterworth.
Stephenson, Christopher, Park Farm Office, Woburn.
Sturgeon, Joseph, Norton Hall, Woolpit.
Stutter, Cawston, Kilns Farm, Woolpit.
Taylor, Edwin, Bury St. Edmund's.
Thorn, Charles, Norwich.
Thornhill, Thos., jun., Pakenham Lodge, Bury St. Edmund's.
Thornton, Thomas, Cavenham House, Wereham, Stoke Ferry.
Waite, John Newman, Martham Hall, Great Yarmouth.
Wells, Henry, Occold, Eye.
Wigston, Richard, Horningsheath, Bury St. Edmund's.
Wilson, George Henry, Morston, Thetford.
Wright, J. E., Preston, Lavenham.
Youngman, Philip, Walsham-le-Willows, Ixworth.

Finances. — Mr. Torr presented the Report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on February 28th was £1382 17s. 8d. The Committee have to report the death of Sir John Shelley, Bart., one of the trustees of the funds of the Society, and they recommend that the name of the Right Hon. the Earl of Powis be substituted in the bank books. The Committee again wish to draw the attention of the Council to the great inequality in charges for advertisements, and also whether the present selection of newspapers might not be improved. This report was adopted, and a committee consisting of the Chairman of the Finance Committee, the Chairman of the Journal Committee, the Chairman of the General Bury Committee, the Earl of Powis, Mr. Brandreth Gibb, Mr. Wren Hoskyns, Mr. Randall, and Mr. Torr, was appointed to consider this subject.

Journal.—The President announced that the reports on Steam Cultivation have all been sent in; that one is now in type, and a second in the printer's hands.

Discussions at Weekly Councils. — The attendance at lectures or discussions at Weekly Councils has been so generally meagre and unsatisfactory, and on the last occasion was so complete a failure, notwithstanding the ability of the lecturer and the interesting character of the lecture itself, that the Committee invite the especial consideration of the Council to the question, before any further appointment of subjects and speakers be decided upon. Mr. Holland, M.P., having moved that the subject selected for agricultural discussion be duly advertised for the first Tuesday in the month of the Society's season, at 8 o'clock in the evening, and that gentlemen conversant with this selected subject, whether members or not, be specially invited by the Secretary to take part in the discussion; also that a similar announcement of the subject of lecture or discussion shall be placed on the Agenda paper of the Council; the Report and Mr. Holland's motion were adopted.

Chemical.—Mr. Wren Hoskyns reported that the Chemical grant for 1866-7 had been awarded to Dr. Voelcker, for his papers in the last number of the Journal, on:

1. Field Experiments on Clover-seeds.
2. Improvement of Grass-land on the Manor Farm, Braydon, Wilts.

And in the forthcoming number, on:

1. The Growth of Clover, and the Changes it undergoes in Haymaking, both in the Field and in the Stack.
2. Potash Experiments on Mangels.

The Professor proposes to draw up some directions as to the preparation of Samples for Analyses—viz., of Soils, Feeding Materials, and Manures.

The subjects for Lectures in 1867 named by Dr. Voelcker, and determined by the Committee, are: 1. The Relative Value of different kinds of Purchased Food, with especial reference to their Manurial Properties. 2. The Chemical Changes in Haymaking, in the Field and in the Stack.

This report was adopted.

Veterinary.—The Committee report that they have elected Major-General the Hon. A. N. Hood Chairman of the Committee.

They have considered the report of the Governors of the Royal Veterinary College, referred to them by the Council. This report differs from any previous reports in not being, as heretofore, drawn up entirely by Professor Simonds.

The earlier portion of it deals with the continued efforts of the College to provide educated members of the veterinary profession, and asks the assistance of this Council in obtaining from the Legislature a recognition of the position of veterinary surgeons.

Professor Simonds's report deals at considerable length with the several diseases which have been rife amongst domestic animals during the last year. After referring to the Cattle Plague, and its extension to Sheep, the Professor expresses a hope that the disease may now be considered almost at an end in this country.

Diarrhœa in Sheep has been very prevalent, and, being a constant accompaniment of Cattle Disease in those animals, has caused some doubts to arise as to the existence of Cattle Disease amongst Sheep. Means have been suggested, with success, for the prevention and treatment of this disease.

The attacks of pleuro-pneumonia and foot-and-mouth disease have very much decreased, mainly arising from the restrictions in the movement of cattle, and the precautions taken against the cattle plague.

Twelve cases of small-pox in sheep have occurred, eleven clearly traced to foreign importation. The Professor recommends further experiments in inoculation with the virus of small-pox and cattle-plague, in order to test the length of time during which the poison has an active existence.

Cases of rickets in lambs have been admitted to the College, but for this disease at present neither curative nor preventive treatment has been found satisfactory.

Dr. Cobbold and the Professor have been occupied in important investigations into diseases connected with entozoa: no less than 42 animals have been treated, and 150 administrations of the parasites have taken place under the joint-superintendence of the above-named gentlemen. Important information has been acquired which may lead to valuable suggestions both for prevention and cure. Winged fowls feeding on trachinous flesh are not subject to the disease, hence game and poultry are a safe food for human beings.

Gastro-enteritis and splenic apoplexy have been frequent, and the Professor has been enabled to suggest preventive treatment in several cases.

The Committee recommend that the whole report of the Governors of the Royal Veterinary College be referred to the Journal Committee to publish such portions as they may think fit.

Of one of the cases of splenic apoplexy visited by Professor Simonds where pigs, sheep, and cattle were affected, he has promised to afford this Committee a detailed report before their next meeting.

BURY ST. EDMUND'S MEETING. — Lord Tredegar, chairman, presented the Report of the Committee, stating that the setting out of the railway siding was already commenced. They recommended that chains and locks for the poultry pens should be provided by the Society; That the band of the Coldstream Regiment of Foot Guards be engaged to play in the Showyard at a cost of about £170; That the General Regulation, No. 8 of the Prize Sheet, be altered so that horses may be admitted up to 4 p.m. on Saturday, the 13th July; That badges for Members of Council have the word "Council" printed on them; and that the Surveyor go down as soon as possible to set out the Showyard. This Report was adopted.

EDUCATION.—The Earl of Powis presented the Report of the Education Committee. The Committee have to report the results of the Cambridge Local Examinations held in December, 1866:

I. Mechanics applied to Agriculture.—The examiners report that only nine candidates attempted these papers, and that they are unable to recommend any of them for the prize.

Chemistry applied to Agriculture.—The examiners report that only seven candidates offered themselves. They recommend R. M. Swannick, of the Royal Agricultural College, Cirencester, for a secondary prize of £2.

II. Candidates who obtained Certificates, regard being had to their place in the general Class List.—*Seniors:* a 1st prize of £5; 18 were examined. The first prize is adjudged to C. J. Langley, of Abington House School, Northampton. Secondary prizes of £2 each to H. T. Bovey, of Clevedon College, Northampton; Thomas Hill of Grammar School, Wolverhampton; William Waterhouse, of Grammar School, Lancaster. Five others are reported to have done creditably, and only one to have failed.—*Juniors:* a 1st prize of £5; 44 were examined. The 1st prize is adjudged to E. King, Abington House School, Northampton. Secondary prizes of £2 each to J. E. Betts, of Mr. Durham's, Northampton; H. Cooch, of Mr. Durham's, Northampton; E. B. Hunt, Clewer House School, Windsor; F. W. Weaver, Grammar School, Wolverhampton. Ten others are reported to have done creditably, and four to have failed.

III. To candidates who (having passed the preliminary examination) are distinguished in any of the following special subjects:

Seniors.

Section E., Pure Mathematics—a 1st prize of £5, adjudged to C. J. Langley, Abington House School. We recommend H. T. Bovey for a secondary prize of £2. 19 were examined.

Applied Mathematics.—A 1st prize of £5 adjudged to H. T. Bovey, of Clevedon College, Northampton. We recommend C. J. Langley, of Abington House School, for a secondary prize of £2. 10 were examined.

Section F., Chemistry, a 1st prize of £5. No name is published by the examiners as distinguished in this section, and we are therefore unable to recommend any candidate for a 1st prize. As, however, T. W. L. Hay, of Brewood Grammar School, stands 1st in this section, and in Section G. 1 (Zoology), we recommend him for a secondary prize of £2. Three were examined.

Section G. 1, Zoology, a 1st prize of £5; 2, Botany, a 1st prize of £5. Two were examined in zoology; three were examined in botany. No name is published by the examiners as distinguished in either of these classes. We recommend W. P. Reynolds, of Clewer House, Windsor, for a secondary prize of £2 in Botany.

Section G. 3, Geology, a 1st prize of £5. The 1st prize is adjudged to W. Waterhouse, of the Grammar School, Lancaster. We recommend W. H. Chippenall, of Grammar School, Lancaster, for a secondary prize of £2. Five were examined.

Juniors.

Section 7. Pure Mathematics, a 1st prize of 5*l.* The 1st prize is adjudged to W. S. Waymouth, of Montvidere House, Torquay. We recommend J. E. Betts, of Mr. Durham's, Northampton, and E. King, of Abington House School, Northampton, for secondary prizes of 2*l.* Forty were examined, and two others were reported to have done creditably.

Section 8. Mechanics, a 1st prize of 5*l.* The first prize was adjudged to E. King, of Abington House School. We recommend W. S. Waymouth, of Montvidere House, for a secondary prize of 2*l.* Eight were examined.

Section 9. Chemistry, a 1st prize of 6*l.* The first prize was adjudged to J. E. Betts, of Mr. Durham's, and we recommend R. Cambridge, of the Liverpool Institute, for a secondary prize of 2*l.* Three were examined.

Section 10. (*a*) Zoology, a 1st prize of 5*l.* The 1st prize is adjudged to R. Capron, of Fulland's School, Taunton. We recommend Frank Hicks, of Clewer House School, Windsor, for a secondary prize of 2*l.* Three were examined. (*b*) Botany, a 1st prize of 5*l.* The first prize is adjudged to H. Cooch, of Mr. Durham's. We recommend E. B. Hunt, Clewer House School, Windsor, for a secondary prize of 2*l.*

Senior Scholarship.—No candidate complied with the conditions for this scholarship.

Four junior scholarships.—These are adjudged to E. King, of Abington House School, Northampton; E. B. Hunt, Clewer House School, Windsor; J. E. Vidler, of Clewer House School, Windsor; C. A. Day, of Clevedon College, Northampton. Charles Higham, of Clevedon College, also distinguished himself in the examination. Seven were examined.

The Council will notice the smallness of the number of competitors for Mechanics as applied to Agriculture; Chemistry as applied to Agriculture; Chemistry, Zoology, and Botany among the Seniors, as compared with those for Pure Mathematics and Applied Mathematics. The Committee consider that this is explained by the special nature of these studies and the short time that has elapsed since the attention of teachers and pupils has been specially directed to these branches of knowledge. The position of Geology is more satisfactory.

In Class II. the number and position of candidates who obtained certificates are very satisfactory.

The junior examinations throughout are satisfactory, and afford promise of improvement among the seniors in future years. The Committee regret that no candidate appeared for the Senior Scholarship, by which they had hoped to promote the union of agricultural with general education. They are happy to report that the examinations passed for the Junior Scholarships were highly satisfactory.

This report was adopted.

On the motion of Mr. Dent, M.P., seconded by Mr. Read, M.P., a Fifth Junior Scholarship of £20 was awarded to Charles Higham, of Clevedon College, who distinguished himself in the recent examination.

STEAM CULTIVATION.—Mr. Thompson reported that the Committee had resolved that Mr. J. A. Clarke and Mr. Jacob Wilson be requested to go down to Hereford and see Mr. Howard's double tackle at work, and report before the general Report is published.

COMMITTEE OF SELECTION.—Mr. Thompson reported that the Committee recommend that Lord Tredegar be requested to allow himself to be elected a Governor, and on his consent being obtained, that he be recommended to Council to fill the vacancy caused by the death of Sir J. V. Shelley, Bart., a Trustee. That printed lists of the Society's country districts be prepared, showing the counties of which each district is composed, with blank columns for number of Members of the Society, number of Members of Council, and names of the Members of Council in each of these districts respectively.

On the nomination of the President, seconded by Sir John Johnstone, Bart., M.P., the Right Hon. Lord Tredegar was unanimously elected a trustee of the Society, in the room of the late Sir John Shelley, Bart., for which honour his lordship made his acknowledgments.

Letters from the Foreign Office, enclosing Reports from the Argentine Republic, and from the Supreme Council of Agriculture of Belgium, were read, and the thanks of the Council were accorded for these communications.

A CHAMBER OF AGRICULTURE FOR SUFFOLK.

On Tuesday, March 12, a meeting was held at the White Horse Hotel, Ipswich, for the purpose of forming a Chamber of Agriculture for Suffolk. There was a large attendance of farmers and others interested by business in agriculture from East Suffolk, but very few of the county gentry were present —in fact, only Lord Rendlesham, Mr. George Tomline, M.P., and Colonel R. A. S. Adair; Mr. Tomline took the chair.

Mr. H. **Biddell** said he had written to several gentlemen. Mr. Bence would join in any way he could to carry out the object, but his engagements prevented his attendance at that meeting. Mr. C. A. Schreiber wished to see how the Chamber worked, as did also Sir G. N. Broke-Middleton and Col. Lloyd-Anstruther. Mr. Tollemache said the movement should have his humble support, but he did not see its superiority over a common Farmers' Club. Mr. W. Long thought agricultural subjects could be discussed at farmers' clubs: he saw various difficulties in the way of a Chamber, and did not intimate that it should have his support. They at first thought of having a Chamber of Agriculture for East Suffolk alone, but since they changed their ideas on that subject. He had written to several West Suffolk gentlemen on the subject; but unfortunately they were kept away by a meeting connected with the Suffolk Hunt held that day at Bury.

Mr. **Johnson**, Boyton, moved: "That in the opinion of this meeting it is desirable to establish a Chamber of Agriculture in Suffolk, having for its object to co-operate with other counties and the Central Chamber in London, in watching over all matters relating to agriculture both in and out of Parliament, and in taking such action thereon as may be deemed desirable. Also to discuss or take into consideration any matters of local interest, immediately connected with agriculture."

Mr. W. S. **Grimwade**, Broughton Hall, seconded the motion.

The resolution was carried unanimously.

Mr. **Herman Biddell**, in submitting rules for the constitution of the Chamber, said he thought it was hardly necessary that he should argue as to the necessity for something of this sort being established. It had been said by some that the farmers' clubs could discuss all matters relating to agriculture; but he thought they would agree with him that the general run of farmers' clubs discussed matters relating chiefly to domestic agriculture. Some clubs would not permit subjects of a political nature to be discussed. There were two excellent farmers' clubs in this neighbourhood—that at Eye, and that at Framlingham. He did not know whether politics were excluded by the Eye Club; but they were by that at Framlingham. He did not wish to put Manchester and Suffolk into antagonism, but he would be bound the Manchester men were no better pleased than to see agriculturists sit down and calmly discuss how much artificial food an animal might have in the course of a month. Whilst they were doing that, they would never be interfered with, they would never be found fault with. He did not claim to see further into the political horizon than other people, but it struck him that they would soon have to speak out for themselves. There was an old adage that "if you want anything done well do it yourselves," and it was evident to him that they must adopt it. He was not now speaking of their representation in Parliament, but of the voice they exercised towards the legislature. If anything affecting the commercial interest or the manufacturing interest was talked of, chambers of commerce and associations of all kinds were ready at once to furnish their representatives with the best data on which to deal with the measure. There was, however, no means by which agriculturists could make their representatives aware of their opinions. Their representatives might have their own views on the matter, but they might wish to hear the views of their constituents; and they might desire information, and what course were they to adopt to ascertain those views? The members of the Eye Farmers' Club might express their opinions, and so might those of the Framlingham and Hadleigh clubs, but they did not get the opinion of the county, as they would do from a chamber of agriculture. He confessed he had wished to see a larger number of the landed proprietors of the county present. He and Mr. Everett had taken much trouble to write to gentlemen, and had endeavoured to get the co-operation of landowners. He would be sorry to act without them, and he was glad indeed to see some present. He only wished instead of the three or four or ten who were present there had been ten times that number. What was the tenour of the letters that had been read? It was either that the writer would wait, and see how they were going to act; or that he considered farmers' clubs all that was required; or that the chamber had his good wishes, and would have his support, but not his attendance. That might be all natural enough, but they wanted to have the landed proprietors to start the thing, which was really as much for their benefit as for that of the tenant-farmers. From what was now going on in the political world it was evident that the time was coming when the tenant-farmer would not be strong enough to do things for himself, and he was sure the landowner would find himself in the same position. Whether the two united might not uphold what they had in view he did not know, but this he did know—that in disunion there was no strength. If they did not watch over their own interests, how could they expect other people to do so? It came to this—that they wanted some better way of making their voice heard. He only wished they had the active co-operation of the landlords: he had no wish to work without his landlord. What they did for themselves they did also for the landlords. He hoped they would have their co-operation; but he did not disguise it from the landlords nor withhold it from the tenants—that if the landlords would not work with them they must work alone. It was no use to sit still, and let others legislate for them whilst they ought to legislate for themselves.

Mr. T. **Hawkins** (Bentley) seconded the motion. This was an institution they ought to have established thirty years ago, before the repeal of the corn-laws. If some eight or ten years before the corn-laws were repealed, when it was quite evident that they must be eventually, the farmers had come forward with the same determination they now evinced, to support their own interest, they might have made a much better bargain, and have saved a large portion of their property, which they had to sacrifice. They had now come into the field rather late in the day, but if they were determined to express their opinions in a rational and fair way, they would not only be heard in the legislature, but would bring their landlords to think as they did. It was an undeniable fact, if they looked at the agricultural interest in the House of Commons, that it was something like 30 years behind the rest of the community. He did not say that they wanted ability, but they had come to fancy themselves invulnerable. As a rule, every man was supposed to support the politics of his landlord, and hence they had supposed that they were invulnerable, and that agriculture must triumph; but what had been the case? Their landlords were all defeated and set down as mere cyphers in the minds of those who organized so as to bring their interests before the legislature. Let them just fancy when the corn-laws were repealed if the landlords had accepted an 8s. fixed duty and the manufacturers had thrown the malt-tax into the scale what might have been done. But they were determined not to submit, and the consequence was when they had to submit they had to submit to a great deal more than otherwise would have been the case. Look at the present Government. What a pitiable object they presented to all Europe at this moment; They were obliged to sacrifice their own political opinions on the altar of their most bitter opponents. Why was that? Because they felt themselves so secure that no one could attack them—that they were, so to speak, invulnerable, and that they could get on without the help of the farmers. The interests of the farmers had been going behind. Sir E. Kerrison meant to see which way they went before he joined them, as he had done in another matter. When Sir Edward was the representative of the little borough of Eye he was opposed to the repeal of the Malt-tax; but when he came forward for the county he appeared as a supporter of that movement (laughter). If this Chamber thrived and became prosperous, and could do without assistance, the hon. bart. would most likely condescend to ask to be allowed to join their society (Hear and a laugh). There were many Bills before the House of Commons at this moment which affected their interests, and among them was that which provided that the law relating to children employed in factories should be extended to the children of the agricultural districts, and that required the consideration of both landlords and tenants. Sir E. Kerrison said there was no sympathy between the farmer and the labourer; but that it descended direct from the landlords to the labourers, but was that the case? The farmers never made the law of settlement, and never inserted in leases a clause that it would be a breach of covenant if they made a settlement for a man (Hear, hear). The farmers did not pull down the cottages and let the labourers go without house-room (cheers). He could tell Sir Edward the farmers had as much sympathy for the labourers as other classes, and perhaps more. He should be sorry to say anything that the landlords would take umbrage at, but they must be determined to bring their case forward with the same prominence that people of other classes did theirs, and he hoped this society would not be allowed to drop (cheers).

A committee was then appointed to communicate with some of the leading agriculturists in West Suffolk and invite their co-operation.

THE GAME LAWS IN SCOTLAND BILL.

On Friday, March 8, a meeting of farmers and others interested in the subject of the Game Laws, was held in the Mechanics' Hall, Aberdeen, to consider the bill recently brought into Parliament for a modification of the Game Laws.

Mr. M'Combie, Tillyfour, was called to the chair.

A letter was read from Mr. Fordyce, M.P., in which he thus refers to the Game Law Bill:

"The Game Bill is, no doubt, a compromise. I suppose no one doubts that the effect of its provisions would be a sensible alleviation of the pressure of the game grievance. It goes further probably than many landlords would desire, and not far enough to meet the views of the tenantry. I myself do not approve of all its details. As clause 3 stands at present, the professional poacher would have the best cause to rejoice if it passed into law. But, nevertheless, I support it generally, as dealing with the main elements of the grievance, and aiming at the utmost measure of relief attainable by legislation, and as such I would recommend it to the favourable consideration of the county of Aberdeen. The provisions of the bill are to the following effect: Hares and rabbits are dropped from the game list, and put on the same footing as other pests of the farm—rats, moles &c.—so that any one may take and destroy them who is lawfully on the ground, and even a professional poacher would be merely liable in an action of damage for trespass. I have endeavoured, with success, to induce those who are promoting the bill with myself to restrict the effect of this clause to tenants and all those having their permission; because I do not wish and am certain it is not the desire of the tenantry of Scotland, to encourage poachers or poaching in any way. The required alteration could easily be made, and would obviate what is a just, and is likely to be made a most serious, objection to the bill. The other clauses transfer the administration of the Game Laws from the justices to the sheriff; put an end to the cruel anomaly of trying a man many times over for the same offence; and endeavour to shorten and make less expensive the process for obtaining compensation for damages from game. The bill is based, and ought to be discussed, on the assumption that no Parliament will make contracts for the preservation of hares and rabbits on arable farms directly illegal, and that the object should be how most speedily to get rid of them indirectly. It is very desirable, whatever view is taken of its provisions, that they should receive a full, candid, and temperate discussion from the tenant-farmers. Such a discussion is in itself a powerful aid to the attainment of the end in view—viz., to abolish a system which to my knowledge, and as I ventured to say the other night in the House of Commons, is driving many of them almost to desperation."

The **Chairman** said his views on the Game Laws were very well known; and he might just add here that he could not agree with Mr. Fordyce in accepting the proposed bill as a compromise. They should adhere to their former resolutions; and, indeed, unless contracts for the preservation of hares and rabbits were made illegal, all else would go for nothing.

Mr. **Campbell**, Blairton, moved the following resolution:

"That this meeting, while recognizing the improved administration of the Game Laws proposed by Mr. M'Lagan's Bill now before Parliament, is of opinion that Clause III. provides no material relief to farmers on estates where hares and rabbits are preserved."

In doing so, he said: The administration of the Game Laws, under Mr. M'Lagan's Bill, is no doubt a considerable improvement on our old system. Certainly the jurisdiction of the Sheriff would be a great improvement in place of same time having the game preserving landlord both prosecutor and judge; but I am afraid that the mere taking of hares and rabbits from the game list will give no sensible relief against game-preservers, and it is only from them we require to protect ourselves. I believe it is somewhat doubtful in point of law whether the taking of hares and rabbits from the game list would affect existing leases; game-preserving landlords, I have no doubt, would tell you what *was game* when you signed your lease; was the bargain betwixt you and them; and when present leases expired, should we get no law to the contrary, the game-preserver would take good care to have the hares and rabbits included in any new lease. If Mr. M'Lagan would add a clause to his Bill, rendering all clauses in leases for the preservation of hares and rabbits illegal, his Bill would then have a practical effect, and would do good, but we are aware what the cry against such a clause is that it is an interference with the rights of property and so on. I hold, gentlemen, that it is only an adjustment of these rights. Is it to be tolerated that any man, by purchasing a few acres of land, should have it in his power to foster thereon an excessive number of hares, rabbits, or other game, and feed them on the crops of his neighbours? Yet such is the practical tendency of the views which some have, and act upon as respects the rights of landed property. Now when we see such unjust, unequal, and absurd rights being claimed by our landed proprietors, it is certainly high time the Legislature should interfere. We have a keen recollection of the manner the property of the tenant-farmer was dealt with when that unfortunate scourge, the cattle plague, overtook our herds. I ask, were the rights of tenant farmers to their private property held as sacred in that case, when by an act of our Legislature our cattle was taken, slaughtered and buried, and that without any compensation whatever. Is a bullock not as good as a hare? and is he not as much the private property of a tenant as the hare is that of the landlord? We do not complain of the slaughtering of our cattle, but we do complain, and justly so, that compensation for the cattle was not granted. Our Government, I believe, is at present asking a vote for £25,000 to give something to these reckless, careless parties, who did nothing to save themselves or others; whereas such counties as this, which took action to save themselves, are to get nothing. Our county, during the period said Act was in force, killed upwards of £900 worth of cattle; yet none of said vote is intended for us. The inference deducible from such a disregard of property of the tenant-farmers, and the more than ordinary jealousy manifested by the House of Commons in the landed interest, is that the tenant-farmers are not properly represented there. I am afraid, that before agriculture gets that attention from Parliament which its importance demands, and our statute book be cleared of these old feudal class laws, Entail, Hypothec, and Game, &c., we will require to send our Hopes, M'Combies, and other tenant-farmers to the House of Commons. The great question in connection with the Game Laws is, whether the industry of our agricultural body in the cultivation of these crops, or the sport of our aristocracy, deserves the first attention of our legislators. That the two parties are coming into serious collision is evident to any one interested in the matter. Land ought not to be held either for political or sporting purposes, but for producing food for the people, and the community at large ought to join with the tenant-farmers in demanding the abolition of all laws that in any way retard the producing of food. In this changeable climate, the farmer has enough to contend against, without any such artificial grievance as the Game Laws. While our old proprietors were contented with a little shooting for themselves and friends there was no appreciable damage done; but the system that now obtains of letting the game to third parties, to foster and feed them on the tenants' crops, has become intolerable. The interest of the community demands that the growing crops be protected, and, consequently, that the Game Laws be abolished. We are aware that, leave nature alone, we would have no excess of any of these wild animals; but when man takes their side against nature, and unduly fosters them, there must of necessity be too great abundance of them. I cannot but think that the more than ordinary anxiety manifested by not a few of our landed proprietors (there are, of course, honourable exceptions) for what they call sport is rather degrading to them. I think they could employ their pastime in nobler and far more useful pursuits than in butchering game, for it is butchering game in many instances, and nothing else. The Game Laws are a relic of barbarous times, and of a time when the land of the country was mostly pastoral, and when there were not inhabitants in it to consume the produce, but *we* certainly live in very different times. We are certainly in a more civilized age, and is it too much to expect that the sports of our aristocracy should be a title more civilized too? Other laws are always being remodeled to suit the times, and how is it that the Game Laws are always being rendered stricter and stricter? That they have become incompatible with good farming, and, therefore hurtful to the public interest there can be no question. They limit, to a considerable extent the produce of the soil; and it is impossible to estimate the damage, for the ravages begin as soon as the plant appears, and goes on the whole season. Now, I do not require to tell this meeting how discouraging such ravages are to a farmer who has heavily manured his land, and expects to have a heavy crop, but when harvest comes, finds the damage done by game has frustrated his hopes. The effect is that the farmer's spirits are damped; to save himself he keeps down his manure account, and the consequences are that the produce of the country is considerably lessened. It ought not to be endured that the enterprising spirit of our farmers should be checked, and that he should be barely tolerated to cultivate the soil in place of being encouraged to do so. There is no doubt but game-preserving enhances the price of meat as well as meal, and I think we may assume that at least one-twentieth part of our corn and turnip-crops are destroyed by game and other wild beasts, such as crows, &c. Ths rookeries of these crows kept by some proprietors, certainly exhibit a most callous indifference to the interest of their neighbours. Our average growth of grain in Britain is about sixteen million qrs., one-twentieth of which is 800,000 quarters, or say, upwards of one million of money. This at least is lost, year by year, to the nation in grain alone. In this country, our loss would be equally heavy in turnips, though not so much in the grain-farming districts. I am sure, however, I am within the mark when I say we lose over all another half million in turnips. The effect of all this on the prices of both meal and meat I need not tell this meeting; but is it not too bad that the working man, both in town and country, should have to pay, as he really has, at least 1d. per lb. more for butcher meat, and some 2s. per boll more for meal, merely because some of the worst specimens of our aristocracy will not be deterred from destroying the crops of the country that they themselves may have what they falsely call *sport*. I do not intend in the least to colour matters, but I do think you will bear me out in saying that these are some, at least, of the practical effects of game-preserving. Now, Mr. Chairman, the remedy for these evils is in our own hands, and if the tenant-farmers of Scotland would stand true to each other, and to their own interests, the issue would not be doubtful, in a free and civilized country like this, where justice is said to be freely administered, and all property protected. The Game Laws are certainly a sad and painful contradiction of said protection. Scottish agriculture have now got a mouthpiece in their Chamber at Edinburgh, of which you, Sir, are the respected Chairman; and if its opinions are not heard in Parliament, our various constituencies, I have no doubt, will make theirs be heard the first opportunity, for if farmers stand firmly and unitedly to one another, no Government can withstand their just demands. One thing, I think, which we ought to agitate for is additional members to some of our Scottish counties. In any Redistribution Bill, Scotland is entitled to additional members, and as agriculturists, we ought to see that we get a fair share of them for the counties. Our county, I think, ought to have three members.

Mr. DOUGLAS, Buchaam, seconded; and the resolution, on being put to the meeting, was carried by acclamation.

Mr. COPLAND, Mill of Ardlethen, moved the next resolution, as follows: "That any measure to be regarded as a settlement of the question of game-preserving must provide not only that occupiers of arable farms have right to kill hares and rabbits, but also declare all contracts for their preservation on arable farms illegal, as contrary to the public good." He said he was very sorry that their cause had not made great progress in Parliament since their last meeting; but he was glad to see that it had made a great deal of progress throughout the country generally; and even in this county a great change had come over many of their proprietors. Many of them had granted to the tenants the right to kill hares and rabbits. He was hopeful that all the proprietors would have done this; so that the necessity for any legislation would have ceased, and all angry feeling between landlord and tenant put an end to. Seeing that the strict game-preservers refused this, he could not but think that the tenantry, who suffered most, were called upon still to agitate, and to use every legal and constitutional means in their power to obtain redress. He did not look upon this as a political question, although a good deal of political capital had been made out of it. He urged it, however, not as a political, but as an agricultural grievance, from which many suffer greatly, and one which they ought to do everything in their power to have removed. The latter part of the resolution declared all contracts for the preservation of game on arable lands illegal. When he last spoke to this part of the resolution, he had said that no doubt many would look upon this as a hard, harsh measure, and not likely to be passed easily through Parliament. He was still of the same opinion; but he was also of opinion that, though the first part of the resolution were carried to-morrow, or M'Lagan's bill passed, it could be all of very little benefit to them—indeed almost a dead letter—if the proprietors who had no confidence in their tenantry, not so much even as to allow them to kill a hare or a rabbit, meantime could find means to bind them down, if they thought fit. Mr. Fordyce, the county member, had declared that he adhered to this resolution; not only so, but he had done him the honour—whether intended or not, he could not say—of quoting the very words he (Mr. Copland) used in supporting it. So it would be seen they were making progress even in Parliament, and they might continue to do so. They had their own member prepared to advocate their views, and others would join him; but this would be very far short of carrying this resolution through Parliament. Still, there was no saying what time might do, and if they were all anxious to get others round to their opinion, he could only refer to his former advice, to show to the public that they had right on their side; not by loud and empty talk, but by a quiet calm exposition of their grievances, and by showing the injury and injustice they suffered under the present system. If they acted thus, no doubt they would ultimately succeed.

Mr. WEBSTER, Newlands, briefly seconded; and the resolution, having been put from the chair, was unanimously agreed to.

Mr. G. SKINNER, Cottown, Leslie, proposed the next resolution, which was seconded by Mr. Craighead, Tarves, and also carried unanimously. It was as follows: "That the thanks of this meeting be transmitted to Mr. M'Lagan, M.P. for Linlithgow, and Mr. Fordyce, M.P. for Aberdeenshire, for the proposed improvement of the Game Laws, and that they be requested to bring forward, as soon as they shall deem it expedient, a bill embodying the views expressed by this meeting."

A vote of thanks to the Chairman concluded the business.

CHEAP BEEF SUPPLIES.

South America is becoming a strong competitor with more cultivated countries, not only in wool production, but in meat supplies. The South American pampas have long been the home of immense herds of cattle. Columbus, in one of his New World voyages, brought specimens of European stock. Importations followed in the various settlements in South America. The Indians were early taught by Jesuit missionaries to milk the cow and use her milk and meat, and ultimately to yoke oxen by the horns for hauling drift-wood and other burdens. More than three hundred years ago cattle were taken from the coast of Brazil to the grassy plains of Paraguay. Prior even to that importation, it is claimed that herds were established in Peru, introduced from the Pacific coast, which soon spread into the pampas.

The following facts concerning this interest are from rev. G. D. Carrow, who furnished an essay on the subject for the Agricultural Report for 1865 :

"In killing cattle for home consumption the butchers first hamstring them and then cut their throats. In dressing them they are not suspended, but flayed on the ground. Some years ago the Buenos Ayrean city fathers prepared a slaughter-house of the same style and conveniences as are common in other countries, but the butchers refused to occupy it, and stedfastly adhered to the old custom of hamstringing and throat-cutting in an open pen. The carcass is divided in a mode somewhat peculiar. The tenderloin is taken out and sold by itself. Beef is never weighed in market, nor even measured, except by the butcher's eye, who acquires great exactness in subdividing the quarters of an animal so as to make the pieces suit the daily, bi-weekly, or tri-weekly demands of his customers. The beef market of the pampas was in former years probably the cheapest in the civilized world. So recently as twenty years ago an ordinary cow or heifer could be bought for one silver dollar, and a large fat steer for two dollars and a half. Now, the prices of the same animal range from eight to twenty dollars.

"In 1858 a piece of sirloin, weighing ten pounds, could be purchased in the market of Buenos Ayres or Montevideo for fifty cents, and in the towns of the interior for half that sum.

"The natives are very partial to roast beef, which they term *asado*; but their mode of preparing it is peculiar to themselves. They take the best roasting pieces and cut away the flesh till the rib is reduced to nearly the thinness of an ordinary sparerib of pork, according to our method of butchering. This is done to suit their mode of roasting, which is never in accordance with that which obtains in Paris, London, or New York. Instead of the oven, they still use the more primitive spit. This is a piece of iron about four feet long. It is run through the meat, and, if the meat be prepared in the open air, is stuck into the ground at such an angle as brings the meat into contact with the tip of the flame; or, if the meat be prepared in the kitchen, the spit is inclined against the chimney in about the same position. The fire is kindled with weeds or small dry faggots cut from the paradise or peach tree. As this consumes very quickly, fresh fuel is constantly supplied. When the fat of the flesh ignites and blazes, the cook seizes the spit, blows out the flame, and then returns it to its place. This is repeated till the meat is nearly done, when the spit is laid across two large bricks, and the process is completed by toasting a few minutes over the fresh coals. Meat cooked in this way is somewhat smoked and a good deal blackened, but it has a juiciness and a peculiar flavour which could not fail to commend it to the palate of a finished epicure.

"Some travellers complain of the toughness of the native roast; but the writer's experience is altogether in conflict with their statements, and his impression is that they must have fallen into the hands of a very unskilful cook, or upon the carcass of an animal that had been toughened by poverty and leanness or unusual length of days. The qualities of the beef are very superior. English residents, generally, do not esteem it; but this is owing to that intense national egotism from which few even of travelled Englishmen ever entirely recover. They will roundly assert that neither first-rate beef nor mutton can be found beyond the limits of the British Isles. But many Americans, who have travelled extensively on both continents, consider the best pampa beef fully equal, if not a little superior, to the best beef ever brought to an English market. It has not the same amount of fat, nor is the fat so thoroughly distributed through the lean portions of the carcase, but it is sufficiently fat to meet the demand of any delicate and well-educated palate. The tissues are so fine as to render the flesh peculiarly tender, and, when cooked, it has a flavour akin to that which distinguishes the flesh of the wild duck from that of the flock which is hatched in the poultry house and reared in the barn-yard. It is also very easily digested. A feeble, dyspeptic stomach may take as much as the appetite of a hungry man will ever crave, and not be oppressed by the indulgence. Pampa beef, as well as pampa air, might safely be prescribed for all invalids suffering from dyspepsia, and assailed by its veteran ranks of horrors and blue devils.

"An establishment for preparing jerked beef is called a *saladero*—literally, salting tub. The mode of slaughtering the cattle and preparing the beef is very simple. As in the case of 'marking,' the herd is driven into a large pen. A man or boy, with a lasso attached to his saddle girth, throws the noose around the horns of the animal. The lasso traverses a pulley, suspended from a cross-beam resting on two strong upright posts. The horse draws the head of the animal directly up to the beam, where a man or boy sits with a long knife. The moment the head touches the beam the knife severs the spinal cord just back of the horns, and the animal drops on a movable platform which runs on a tramway, and is immediately drawn out of the pen by hand and placed under an open shed, where two men, without hanging the carcase, quickly flay it right and left; two others take out the intestines, cut off the head, divide the trunk into four quarters, hang them on hooks, cut them in slices, throw them into a handbarrow, and, while one wheels off the flesh to be salted, another conveys the hide, bones, horns, and tallow to their appropriate places. In the salting shed is a large tank filled with strong pickle. The slices are deposited in this for a short time, in order to wash them from all blood. They are then hooked out and packed under the shed in alternate layers of meat and salt. The slices take sufficient salt in about a week. They are then removed to another part of the shed, turned, and piled again. This moving and piling is repeated several times. The meat is then hung on poles in the sun for a few days, when it is again piled for the last time, and looks in this, its last stage of preparation, in the separate pieces, very much like cod-fish or sole leather, and, in the aggregate pile, very much like a stack of corn-husks that has stood the storms of a New England winter."

Several new processes of curing beef and mutton are patented in European countries and practised with a good degree of success.

That of Mr. John Morgan, which is quite simple, is based on forced infiltration, with the adoption of the circulatory system as a means for introducing brine into the tissues at little labour and inexpensive machinery. The animal, if a sheep, is killed by a blow on the head; if an ox, by the insertion of the point of a knife at the back of the head, which severs the spinal cord, and causes instantaneous death. The chest is then sawn open, and kept so by a cross-piece of wood, and the heart is exposed. An incision is made in the right ventricle, and another in the left, the blood being allowed to escape; when it has ceased flowing, a pipe with a stop-cock is introduced into the incision in the left ventricle of the heart, and so into the aorta or great vessel leading through the body, and is there firmly retained. This pipe is connected by a gutta percha flexible tube to a barrel containing the fluid to be injected, which is composed of water and salt, (one gallon of brine to the cwt.,) and a quarter to half a pound of nitre carefully refined, and fixed at an altitude of from eighteen to twenty feet. The briny fluid being let on, rushes out at the right side of the heart after traversing all the circulatory organs, clearing the vessels and capillaries, and preparing the body for the second stage, which is performed by closing the incision on the right side of the heart with a sliding forceps, and thereby rendering the circulatory system perfect, with the vessels free and ready to receive the preservative fluid. A few seconds suffice for the brine to infuse the whole body, when by cutting the ear or hoof of the animal, a stream of clear pure brine, untainted by a single particle of blood, will instantly be seen to flow.

Liebig's process reduces the meat to an "essence of beef," requiring thirty-three pounds of meat to make one pound, which is assumed to be sufficient for a soup for one hundred and twenty-eight men. The flesh of the animal is left twenty-four hours after killing to cool, then reduced to a pulp between round iron rollers armed with points, and turned by steam power, and afterwards steamed an hour in a vat of water. A trough-shaped reservoir with a sieve at the bottom draws the juices into a vat, from which the fat is drawn off, and after passing through a filtering vat it is packed in tins as extract of beef. It brings three dollars and upwards per pound in London.

The process of Messrs. Paris and Sloper aims to preserve the meat in the condition of fresh beef, by the destruction of oxygen in the vessel in which it is packed. The bone is extracted, but fat remains. This meat is sent to England to supply the meat deficiency produced in part by the prevalence of the rinderpest, where it is sold for four to five pence per pound, or eight to ten cents of our money. It seems to give pretty good satisfaction. The report explains that "from the tins in which it is placed the air is exhausted by means of water forced in at the bottom, which, when it reaches the top, is allowed to redescend and run off, and the vacuum thus left is filled from above by a certain gas, the composition of which is kept a profound secret. The two holes at the top and bottom are carefully soldered down, and the meat is then ready for exportation. The only risk it runs is from leakage, the smallest opening in the tin case proving destructive, by allowing the gas to escape and the air to get in."

Several processes have also been discovered in this country for the reduction of the nutritive elements of beef to convenient portable bulk, among which may be mentioned that of Gail Borden, of Texas, of "condensed milk" celebrity," who gave us the meat biscuit, but which appears to have been practically discarded. A few years since, Professor Horsford, of Harvard College, invented a process of desiccation, whereby many rations of beef might be carried by the soldier in his haversack; but the condensation did not become popular in the army, and can scarcely be called a success, though modifications may yet render it such.

Prior to the late war, Dr. N. B. Marsh, of Ohio, devised a system of embalming beef, and removed to Texas for the purpose of engaging in the enterprise. He soon after died, however, and the patent was neglected until recently, when it was purchased by Colonel W. C. Alberger, of New York. By this process the animal is killed by a blow on the head, the breastbone is lifted, both sides of the heart opened, and as soon as the blood ceases to flow, a pipe is inserted in the left side of the heart, connected with a tank of cold brine. The brine is forced through the arteries and capillaries, and in a few moments it is found pouring out from the right side of the heart. The meat is thus chilled and can be immediately cut and packed. The animal is dressed after the curing.—*Report of American Minister of Agriculture.*

THE SMITHFIELD CLUB.

At a meeting of the Council of the Smithfield Club, held at the Agricultural Hall, on Tuesday, March 5th, 1867; present Major-General the Hon. A. N. Hood, president, in the chair; Lord Tredegar, vice-president; and Messrs. B. E. Bennett, J. Beasley, J. Baldwin, J. Clayden, J. Druce, T. Duckham, W. Farthing, J. Giblett, Brandreth Gibbs (Hon. Secretary), R. Hornsby, C. Howard, W. Ladds, E. W. Moore, R. Milward, J. Painter, W. Rigden, C. S. Read, M.P., W. Sanday, J. Shuttleworth, W. Torr (trustee), T. Twitchell, H. Thurnall, and O. Wallis;

The minutes of the last Council meeting were read and confirmed.

Mr. John Painter, of Forest-road, Nottingham, and Mr. Thomas Duckham, of Baysham Court, Ross, Herefordshire, were elected stewards of live stock for the ensuing three years, to succeed the two who retire by rotation.

Mr. Sanday and Mr. Robert Overman were re-elected stewards of the implement department.

The prize-sheet for the present year was considered, and it was determined to omit the second prizes in the division for cattle of the long-horn breed.

It was resolved:—"That a list of the winners of gold medals and silver cups at the past shows of the Club be printed at the end of the annual prize-sheets, the same to be a reprint and continuation of the tabular statement in the appendix to the Honorary Secretary's 'History of the Smithfield Club.'

"That the President's suggestion that 'An annual report on the animals exhibited at the Club Shows should be prepared and published,' be referred to a committee for consideration.

"That a list of the members of the Club be printed at the end of the prize-sheet.

"That the annual dinner take place on the Monday of the show week, at six o'clock (instead of the Wednesday as heretofore), and that the president and stewards be requested to revise the toast list, and make such other arrangements as may appear advisable in reference to the dinner.

"That none but the official placard respecting the food on which animals have been fed be allowed to be placed over the heads of animals, or about the Hall."

The implement committee was reappointed, with the addition of Mr. Richard Hornsby (in lieu of the late Mr. Garrett). The committee to have the same duties as heretofore.

Mr. Samuel Jonas, of Chrishall Grange, Saffron Walden, was elected a member of Council to supply the vacancy caused by the election of Mr. Torr as a trustee at the last meeting of the Club.

The deaths of Lord Feversham, and C. T. Tower, Esq., vice-presidents, were announced. The vacancies will be filled up at the next Council meeting.

A committee was appointed consisting of the president, the trustees, and the implement committee, including all the stewards, to consider and confer with the directors of the Agricultural Hall Company on the subject of increasing the implement galleries, and to report to a meeting of the Council to be summoned for that purpose. The same committee to consider the president's suggestion as to a report on the animals.

The following were elected members of the Club: Wm. Pritchard, the Royal Veterinary College; William Henry Hitchcock, Miserden Park, Cirencester; and W. Wells Kilpin, Bickerings, Woburn.

The thanks of the meeting were voted to the president for his conduct in the chair.

EMIGRATION, AND WHERE TO GO TO.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—The above question, originating in the admirable paper read by Mr. James Howard, on the United States of America, and taken up by the Rev. E. Smythies at the last meeting of the Farmers' Club, having created such an amount of interest amongst your readers, I trust you will allow me space for a few remarks on the subject. The paper read by Mr. Smythies I expected would have furnished considerably more information about our colonies, but it seemed to be more calculated to run them down, and to set up the Argentine Republic as the only place for men of capital and experience to emigrate to. Not having yet been elected a member of the Club, I was taken by surprise when invited by the Chairman to make a few remarks. I, however, felt called upon to stand up in defence of a colony I have passed so many years in, and had so much experience of, and seen what can be done in many parts of the Cape Colony, more particularly the Eastern Province, by a judicious investment of capital. The slight allusion made to the Cape by Mr. Smythies, that the soil was of a sterile character, and that the sheep all ran to fat in their tails, I must at once contradict, the soil being so productive, especially in Kaffraria, that two crops a year of oats, wheat, and tobacco, and frequently four crops of potatoes, are obtained off the same land in favourable seasons, and this without manure, which, as a rule, is hardly considered worth carting. In fact, the remarks made in Mr. James Howard's paper on cultivation of the soil and manuring apply in a remarkable degree to farming in South Africa: crops of oats and maize are grown year after year on the same land with one ploughing over, which is frequently done by natives, who find their own ploughs and oxen for 6s. to 7s. an acre. The Government price for picked land is £1 per acre, but at present there are numbers of good farms to be bought in British Kaffraria at much lower prices, they having been granted to men without capital who have had to mortgage at high rates of interest to enable them to build and stock them, these grantees again moving higher up and obtaining fresh grants as a means of border defence. As to the sheep being all tails, this breed has long since become as scarce as elephants; importation of English and French breeds has been carried on for years, and there are many hundred farmers who have imported rams in their flocks that have cost them £70 or £80 each, resulting in a vast improvement in quality and quantity of the wool. The climate is certainly as fine as any in the world, there being no real winter; but, like Queensland, Australia, and South America, it is subject to droughts; but this can be provided for by those who select their farms on the banks of one of the numerous rivers flowing in the eastern province, and employing capital in the various means of irrigation now at command.

As a horse-breeding country, the Cape is peculiarly well adapted, and being within thirty-five days' sail of the Indian markets, to which it sent over 7,000 horses during the mutiny, and which have been found more suitable to the climate and work than the Australian horses, will soon cause a large trade in that direction, and make it well worth the farmers' while to carry on horse breeding with more care than hitherto. Cattle breeding is also carried on to a large extent; and on farms that are suitable for grazing herds it is most profitable, the large numbers of oxen required for the transport of the country making a constant market. The great drawback to stock farming, namely, Kaffir wars, is over; the great increase of white population, and the number of rifles, having convinced the Kaffirs that peace is more to their interest. In conclusion, I may state that, from the result of my experience in that country, I have secured several good farms round King William Town, and am sending out thorough-bred mares in foal, well-bred sheep, and cattle, pumps and machinery of various sorts for irrigation and improvement in agriculture, and intend to return in a few months, to carry on breeding, buying, and shipping horses for India, breeding first-class sheep, cattle, and pigs, for supply of other farmers, and purchase of wool for shipment to England, and am obtaining the assistance of men of capital, who are disposed to join me, two of whom were Cape farmers, tempted to sell off by the glowing accounts set forth by emigration agents. One proceeded to the Argentine Republic, and the other to New Zealand; but neither could see the advantage of a change, and both are glad to return with me. I shall be glad to furnish any of your readers, who may think of emigrating, with any information and particulars of what I am going to do in South Africa.

Yours faithfully,

Naval and Military Club, Cambridge House, March 14. JAMES HALL.

I notice in the report of my speech on Monday, that you state the price of a farm I have purchased as £150, whereas it should be £750.

HOW TO DEAL WITH THE MALT-TAX.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—I must beg to say a few words in reply to Mr. Ford's letter in your impression of Monday last. Mr. Ford complains "that the landed interest have avoided consulting the other interests concerned." I am not a member of the Anti-Malt-tax Association, not because I am not a sincere advocate for the repeal of the tax in its present shape, but because I considered it a mere waste of breath to ask for repeal *pur et simple*, which I understand to have been the principle on which that Association was formed: it was, however, open to any maltster or brewer—who are, I presume, the "other interests" Mr. Ford alludes to—to have joined the Association. Again: when I submitted to the late Chancellor of the Exchequer a scheme for commuting the Malt-tax, his first inquiry was, "Will it have the support of the trade?" That scheme is not unknown in Norfolk, Suffolk, or Essex, at Ware or at Stortford. I should have been very glad at that time to have been able to tell Mr. Gladstone that the trade of those towns had authorized me to say that they had no objection to the scheme. The intelligent men in the trade, I believe, had none; but the great brewers—their best customers—would listen to nothing that tended to alter the retail price of beer. One extensive maltster did come forward, and expounded with great clearness the whole scheme at the annual dinner of the Tewkesbury Grain Show in 1865, and concluded by saying that, if they would only give him my scheme he could "make more of it, make it better, and make it cheaper."

The last communication I had with Mr. Gladstone, in 1865, was to ask him if he would move for a committee of inquiry, or support a motion for one. He excused himself on the ground that he was about to introduce the Malting-by-weight Bill (to which Mr. Ford alludes), which he was advised would equalise the duty on the different qualities of barley. At last, I trust, we are about to have a committee of inquiry. The prime object, however, of that committee, will not be my scheme—nor do I wish it to be—but an inquiry as to the possibility of substituting a tax on beer for the present Malt-tax. If that should be adopted, the maltster must prepare for free trade, as it is hardly to be presumed that Parliament will continue the present prohibitory differential duty of 3s. 4d. in favour of home-made malt. Whether the maltster might not have fared better under my scheme is a question rather for him than me.

A return of the malt brought to charge in each round of 1866 has, I believe, already been moved for; and, when made, we shall be able to form a better idea on the subject of Mr. Ford's letter.—Your obedient servant,

Wm. Gurdon.

Brantham Court, March 1st, 1867.

THE MALT-TAX.

Sir,—The letters in your weekly impressions on the subject of the malt-tax must eventually open the eyes of the taxpayers of the country to the great absurdity of the present agitation. Upon what is the argument for repeal now based? Simply, that all others having failed, it falls back on the circumstance of the present Chancellor of the Exchequer having proposed in his budget of 1853 a reduction of the tax, he is bound, *nolens-volens*, to do the same again. Can absurdity go much further? I think not. Mr. Disraeli well answered the deputation the other day, when he referred to the doubtful support the Government of 1853 received: will it be better now?

"A Practical Farmer" has been well answered by Mr. J. Watson and "A Practical Chemist." "A Practical Farmer" (whatever that means) would do well to consult the committee of gentlemen who are endeavouring to procure an alteration in public-house licences, they being of opinion that a reduction in the consumption of beer is necessary for the morality of the country.

Mr. Bass, in the House of Commons, on the 26th ult., boasted of paying £11,000 as a licence for carrying on his business. No wonder he wishes the malt-duty to be repealed.

Mr. Watson states the truth when he says "that a man frequently drinks ten pints of beer daily." This is supposed to be home-brewed. Who can tell of what home-brewed is made? The public brewers are by law compelled to use nothing but malt and sugar. Surely, Legislators—be they farmers' friends or not—can hardly be expected to pass a law by which the consumption of beer should be increased beyond ten pints of beer for every man daily!

Mr. W. Ford is mistaken in saying that "The Excise have no check upon the amount (of sugar) used by the brewer." All sugar consumed by a public brewer is entered on the Inland Revenue entry paper, and the quantity so entered is subject to a duty, besides an additional sugar licence for the privilege of using it.

I have not said anything financially of the mischievous results that would arise by the loss of £6,000,000 of taxation, collected easier than any other tax. If necessary, I can go into that part of the subject when "A Practical Farmer" has answered the letters of Mr. J. Watson and "A Practical Chemist."

Yours faithfully,

Maidstone, Feb. 28th. J. H. Baverstock.

THE LABOURER AND HIS DRINK.

Sir,—Perhaps the experience of a Gloucestershire farmer, on the subject of drink for labourers, may be allowed a place in your columns. I employ from twelve to eighteen men during the harvest, and give them nothing stronger to drink than cocoa, of which they have an abundant supply. This plan has now been tried since the spring of 1863, when I entered the farm. My men work well, and willingly, sometimes in unsettled weather, far into the night, and are as calm and clearheaded at the end of the day as at its commencement. The men in the neighbourhood know my practice, and I do not find difficulty in obtaining a sufficient number of hands. I can strongly recommend the plan as best both for master and men, and feel confident that the men would compare, in the amount and quality of their work, with those on any farm where they use intoxicating drinks. The first summer I adopted the practice, I was myself astonished at the entire absence of bad language, which so often accompanies the free use of beer or cider. It is true this plan occasions some extra trouble within-doors; but this may be greatly lessened by a little forethought, and a sufficient number of jars, so that they may be filled when convenient, and be ready when wanted for the field. We use the soluble cocoa, costing from 6d. to 7d. per lb., according to the quantity purchased. The proportions are 1 ounce of cocoa and 1 ounce of sugar to 1 quart of boiling water, with milk or not as preferred by the men. The total cost is less than 4d. per gallon. The men enjoy the drink, which is sent out to them warm. I do not find drink at other parts of the year, except on extra occasions, such as thrashing, sheep-shearing, &c., when I give cocoa, as in harvest. Hoping this may prove a useful suggestion to those of your readers who feel the difficulties of the present system, I remain, respectfully, A Constant Reader.

THE POOR MAN, BEER, AND THE MALT-TAX.

TO THE EDITOR OF THE MARK LANE EXPRESS.

Sir,—I, for one, am glad that you have this week admitted into your columns remarks and statements respecting beer, clearly showing that your correspondent, "A Practical Farmer," has given too much colouring to his picture "Beer, the poor man's beverage." Whoever advocates the abolition of the malt-tax should not, I think, drag the poor man into the question, and make his cause subservient to far higher interests; for I consider that very cheap beer would not make the poor man and his family, generally, better off, or more contented, peaceful, and happy. It is to the too freely imbibing this liquid, which its present price hinders not, that the poor man not unfrequently owes much of his extreme poverty and loss of reputation as a good husband, and an honest and intelligent workman. The effects of beer are both spurring and depressing. Whenever the malt-tax is abolished, and beer sold at one penny a pint, I think that neither the poor man, his wife, or family, nor his employer, will have any real cause to be thankful, as he who inclines to heavy-wet will walk into the public-house with threepence, which now procures him one pint of beer, and obtain three, which surely must do him more harm than good, looking at the proportionate increase, and likely enough to prompt him to do that which he would not, were he the recipient of only one pint. And his employer, instead of having him to work full time, may find that the beer-house, from the quantity of beer sold for a little money, may be a greater inducement to him to stay from his work and carouse, than to depart and earn his daily bread. Malt-tax abolitionists, as a body, think that the poor man would brew at home, if malt were feee of duty. Ask those who have tried it on the poor man's scale, and what do they say? Why, that it soon turns off sour, and that it is not so clear and good, *i. e.*, strong, as what they buy; and, besides, it is pretty certain, I think, it would not change a man's character so as to make him shun his life-long place of resort, or deter the would-be public-house-frequenter from becoming so, as it must be borne in mind that the poor man does not always go to the public-house for beer only, but to meet class acquaintance, to talk-over the sayings and doing on the farm and of the neighbourhood.

I am aware that a great deal of public-house beer has a knock-down effect upon its patronizers; but they like it, and if it did not produce a highly-stimulating feeling, it would not be thought much of. People say the repeal of the malt-tax would cause beer-sellers to sell a purer article; but why it should I am quite at a loss to know, as they, through the competition in beer selling, would be greatly increased, would try to get all the profit they could, the same then, as now; but I don't see, as some do, that the price of barley would be better more than a season or two, as rather more would be grown in this country, and foreign importations might meet any increasing demand. But as barley-growers consider they are unfairly dealt with, it would be well to do away with the malt-tax, but not lessen the price of beer.

Your obedient servant, R. S. H.

Somerset, Feb. 28th.

BEEF *VERSUS* BEER.

Sir,—Permit me, on behalf of my fellow-workmen (at least those who are in the same mind as myself, and I believe they are not a few) to thank you for the productions of several of your correspondents interested in our welfare, and to make a simple remark or two on those productions.

I was taught from a child to work hard and live hard in agricultural pursuits: I now hold the honoured position of "leading man" on a moderate-sized farm, and have held such a position and have taken an equal and leading part in agricultural labour and expenditure for many years past, hence I flatter myself with having obtained some little experience.

In the first place, I cannot think "A Practical Farmer's" plan would benefit us at all; on the contrary, I believe it would tend to add to our dissipation and disgrace. "A Practical Farmer" has shown that drink is obtained to very great excess in some districts, and still wishes to introduce a measure by which it would be more accessible. What a mistake!

When drink is considered necessary, few employers of agricultural labour would perhaps object to a consistent quantity, according to circumstances; but by all means let our employers hold that power.

I cannot agree with "A Practical Farmer" that there is much nutrition in beer. I have lived long enough to *prove* that it is a false stimulant, and that long ago, and (unlike the poor despised "whishy-washy tea"), it too often "leaves a sting behind." Nor can I agree that a more easy access to beer would prove to be much of a "family boon" as described by your correspondent, and I would only appeal to workmen's wives and families for their choice in this matter, as we have no business to neglect their share of the comforts of life. Picture an agricultural labourer and family at breakfast, the man gulping down his beer with its nutritious qualities (?), and the wife and children (five or six perhaps) enjoying the luxury of 2d. worth per week of "whishy-washy" tea, coffee, and sugar, which is described by the same writer as "miserable stuff"!

Surely, sir, you will forgive me if I get irritable at such ideas to raise our position, and permit me to suggest to "A Practical Farmer," who is well up in figures, to employ his talents in calculating how a portion of the barley to be converted into malt might be otherwise profitably converted into an additional supply of beef and pork. We are told that the consumption of malt has exceeded an average of five million quarters annually for the last sixteen years. Would it not be a "boon" if one-fourth only of the barley thus consumed was converted into "solids" instead of "liquids," and thus enable those poor wretches whose condition is depicted in your correspondent's epistle as having scarcely a taste of animal food except to just "savour their porridge," to have an additional slice to savour their potatoes also? Does "A Practical Farmer" mean to say that if labourers have a "craving for beer" they must be encouraged in such cravings irrespective of the results? I believe it is admitted that drink is the greatest curse of our nation, and I am inclined to this opinion; then why not aim at our elevation? If we are naturally inclined to go down the hill of dissipation and misery, take us kindly by the hand and point us to the hill of intelligence; and if we have hitherto been groping in the dark valley of ignorance, pity us, and show us our error, and encourage us to educate our children, and thus be enabled to leave the world in a better position than we found it.

Thanks to a kind Providence, there are some practical farmers in our land who have a warm interest in the *real* welfare of their labourers, and in addition to their temporal comforts would not be satisfied if a single individual in their employment was deprived from hearing the Gospel, at least once every Sunday.

Pardon me for thus trespassing, and permit me to hope that more practical farmers will study the comforts due to deserving labour, at least in those districts where we are told that the poor wretches scarcely taste animal food, and thus avoid the *curse* which some would term a "boon."

Every working man ought to be truly grateful for the letter of a "Practical Chemist," and the sentiments contained in Mr. Watson's letter ought to be written in *large type* and hung over every workman's fire-place.

I am, sir, yours most obediently,
A PRACTICAL WORKMAN.

March 1st, 1867.

EMIGRATION: WHAT TO DO, AND WHERE TO GO.

Did the fitness of a Farmers' Club for dealing with such a subject as emigration require any support from without, it would be gathered from the difficulty in which Mr. Edward Smythies found himself. No sooner was he announced as about to take up the question, than he was involved in a correspondence that he was utterly unable to carry on; while we ourselves can confirm the great interest evinced in the matter by the agricultural world. There were for the last two or three months not only continual inquiries at our office for Mr. James Howard's Paper, but as eager application for the address of Mr. Smythies, for some time previous to this being delivered! The desire to emigrate may not apparently be so strong as it was some twenty or thirty years since, but there are many young men still anxious enough to try and do better abroad than they can ever hope to do at home. A good open examination of the several countries available would consequently promise to be of especial service to such a class of adventurous youth; and the lecture commenced with a caution, as seasonable as ever, as to believing in little or nothing that had ever been printed and published about this or that colony. Remarkably enough, however, Mr. Smythies' own speech depends in a very great degree for its point upon extracts made from a work, the purpose of which is to tell people where to go. Nothing can well be more highly coloured than the descriptions given of the River Plate States: "The delicious and salubrious climate—the extreme fertility of the soil—the wide range and capabilities of production—the unsurpassed adaptability of these countries for stock-breeding—the extent of their river system—the eminently favourable spots to receive an European emigration—the advantageous investment of European capital—the natural richness and extent of the resources—the facilities of water-transit—their commercial tendencies—the unfeigned welcome and protection extended to foreign settlers." All these attractive items are piled up to a pretty considerable height, so as to form "in themselves guarantees to settlers and to Stock-Exchange investments." And Mr. Smythies takes this character from "a thoroughly plain, practical, business-like work," which he regards as an exception to the usual run of guide-books. This may be so; but at the same time it is only right to say that, as we are assured, Mr. Latham, who writes thus favourably on the River Plate, is either a partner in, or a relation of a leading firm at Buenos Ayres, and may thus, almost unwittingly, have spoken too favourably of the land of his adoption. It is certain enough that others do not regard the opportunity in the same light; and we have a letter now before us, wherein an officer, who had sold out with the intention of settling at Buenos Ayres, but who is now on his return home, after carefully examining the country, maintains that "Sheep farming in South America is a clear swindle, a way of losing money gratis; so I will have nothing to say to it, and hope to be in England by the end of March." It might have been better for the Farmers' Club discussion had this gentleman been home again by the beginning of March. What with having a son out there, who also speaks hopefully, we cannot help thinking that Mr. Smythies took his tone too much from the book he quoted; not but that this was occasionally corrected during the discussion. Mr. Allender, for instance, "had received letters from South America, which showed that on one of the points referred to—namely, horse breeding—the advantages possessed by English settlers were very doubtful. It was there stated that the horses even of English settlers had been taken forcibly for war purposes to a very great extent." To which Mr. Smythies answered, "No doubt they were paid for." The removal of this doubt is not quite so clear, as we hear the promises to pay in such cases are plentiful enough, if these are not always performed. The country, in fact, is still subject to continual disturbances; as the existence of the spear-grass must of itself go much against one of the most profitable branches of squatter farming; so that on the whole we are inclined to think that some further inquiry will be as well on the part of the intended settler before he makes up his mind to try his fortunes under the Argentine Confederation. As Mr. Hall says in a letter he has addressed to us: "The paper read by Mr. Smythies I expected would have furnished considerably more information about our colonies; but it seemed to be more calculated to run them down, and to set up the Argentine Republic as the only place for men of capital and experience to emigrate to."

But then Mr. Hall has a pet colony of his own—the Cape of Good Hope—of which he speaks with nine years' experience, and where he has "secured several good farms round King William Town, and is sending out thorough-bred mares in-foal, well-bred sheep, and cattle, pumps and machinery of various sorts for irrigation and improvement in agriculture—intends to return in a few months, to carry on breeding, buying, and shipping horses for India, breeding first-class sheep, cattle, and pigs, for supply of other farmers, and the purchase of wool for shipment to England—has obtained the assistance of men of capital, who are disposed to join, two of whom were Cape farmers, tempted to sell off by the glowing accounts set forth by emigration agents. One proceeded to the Argentine Republic, and the other to New Zealand; but neither could see the advantage of a change, and both are glad to return with me." This is all very encouraging as far as it goes, the more particularly on the strength of a nine years' experience; but hitherto horse-breeding at the Cape has never paid. There is no market, and it was only a few months since that we heard of a breeder who was actually thinking of sending his young stock to England, as there was no sale for these elsewhere. Mr. Hall, it will be found, prefers India; but for some reason or other the Government has never yet looked to the Cape for the remounts. However, two other men of experience, one sick of the Argentine Republic, and the other of New Zealand, are about to join Mr. Hall in raising well-bred horses, cattle, and sheep, though not with the bang-tails Mr. Smythies talks of. And then as to New Zealand, an overworked outlet as it would appear by this time; although a gentleman with twenty years' experience says, "it is a splendid country, but with all the land worth having at too high a price to be worth while now commencing on; still any man with brains, £500 in his pocket, and some go in him, who does not rush in and buy land before knowing something of the place, may do far better than he can in England. The Middle Island, Canterbury Settlement, is the only place to go to." Do any of our readers remember a letter on the farming of this same Canterbury Settlement, which appeared in our columns about two months back? To us this reads more to the point than anything we have seen, as being especially addressed to the man "with £500, and some go in him." Men with larger means will generally have some good recommendation to go on, or not go at all; but it is the youngster with the small capital and ready wit that wants advice, and it is to him that our correspondent S. D. G., writing from Canterbury in the autumn of last year, speaks through our pages: "A farmer landing here with £500 in his pocket would find a choice of three things before him—to rent a cultivated farm, to purchase land from the Government, or to rent uncultivated land with the option of purchase." We cannot here repeat the letter, valuable as it is; but we may give the conclusion:—"A young man, newly-married, say with not sufficient capital to start farming in England, would find here a profitable field of labour, with the certainty of a modest competency in the course of ten or fifteen years. An elderly man, with lots of sons growing up about him, would find, in Canterbury, the labour of each worth £50 a-year; and, when they wanted to start in business for themselves, a few hundreds would give them a better chance for success here than thrice the sum would in England."

What does Mr. Hall's friend, who could not see the advantage of remaining in New Zealand, say in answer to this? Most probably, that he has a larger capital to employ. But we trust also to have the benefit of his experience, as this is a question that cannot be too thoroughly sifted. Like Charles Lamb sending out to his friend at Sydney more than forty years since, the intending emigrant must "have many questions to put. Do you grow your own hemp? What is your staple trade?" And so forth. We write thus much, indeed, with the specific object of promoting further inquiry; and if the River Plate be really worth all that has been said of it; if horses cannot only be bred but sold to a profit at the Cape, and if there be still room for a young man in Australia, we shall be very anxious to have the latest advices. Mr. Howard has treated fully and ably on the opportunities in America and Canada; but although we have had Mr. Latham's work by us for some time, we have hesitated, as we do still, to pass an opinion upon its merits as authority. And to North and South America the two discussions at the Farmers' Club have been chiefly confined.

THE SOUTHERN COUNTIES ASSOCIATION.

A meeting of the council was held at the Society of Arts on Tuesday, March 11. Present: Viscount Eversley, in the chair; Hon. and Rev. S. Best, Mr. Benyon, M.P., Mr. Clutton, Lieutenant-Colonel Deedes, Lieutenant-Colonel Lennard, Mr. Lyall, Sir H. St. John Mildmay, Bart., Mr. Melville Portal, Mr. J. C. Ramsden, Mr. Rigden, Mr. R. J. Spiers., Rev. T. C. Wilks, Mr. Wise; Rev. James Beck and Mr. Shute, secretaries.

The following members were elected: Major Aldridge, Knepp Castle, Horsham; Mr. Thomas Arkcoll, Eastbourne; Mr. William Ashby, East Dean, Eastbourne; Captain B. B. Barttelot, Findon Place, Worthing; Mr. Thomas Bell, The Wakes, Selborne, Hants; Mr. George Blaker, Pilcomb, Hurstpierpoint; Mr. W. Blount; Mr. W. Botting, Westmeston, Hurstpierpoint; Mr. Edward Cane, Berwick, Seaford; Mr. J. Bonham-Carter, M.P., Ashurst St. Mary, Petersfield, Hants; Rev. G. A. Clarkson, Amberley Vicarage, Arundel; Mr. E. W. Cooke, R. A., The Ferns, Hyde-park Gate; Mr. Thomas Cooper, Bishopstone, Lewes; Mr. George C. Coote, Tortington, Arundel; Mr. George Darby, Marklye, Warbleton; Mr. W. H. Dunn, Inglewood House, Hungerford; Mr. I. P. Fearon, Hockenden House, Cuckfield; Mr. A. J. Beresford-Hope, M.P., Bedgebury Park, Goudhurst; Bishop of Oxford, Lavington, Midhurst; Rev. F. Parsons, Selborne, Hants; Mr. John Paxton, Willingdon, Hurst Green; Mr. William Saxby, Rottingdean, Brighton; Rev. E. St. John, Finchampstead, Wokingham; Mr. F. Tupper, West Ham, Hurst Green; Mr. William Webb Turner, Chyngton, Seaford; Misses B. and C. Waters, Eastbourne.

The proposed plan of the showyard at Hove, and estimate for the supply and erection of shedding and offices, were submitted to the council by Mr. Henry Manning, of 251, Holborn (late contractor to the Royal Agricultural Society); and the secretary was authorized to sign a preliminary contract with him for the amount of £587, capable of extension after the first of May, should the number of entries render it requisite.

In reference to the exhibition of works of art in the Pavilion being kept open by the mayor and corporation of Brighton for a month after the closing of the show of the Association, the secretary was directed to inform the mayor that the only guarantee they would require from the corporation for the safe custody of the property handed over to them, was what they themselves give to the lenders, viz., that of extreme vigilance.

The proposal of the East Sussex Horticultural Society, for an interchange of members' tickets during three days of the show week, was declined.

The following stewards of the Brighton show were then chosen:—Stock: Sir Archibald K. Macdonold, Bart., Mr. George Shackel, Mr. James Singer Turner, and Mr. Richard Woodman. Horses: The Earl of Portsmouth and Mr. T. Pain. Implements: Lieutenant-Colonel Deedes and Mr. P. S. Punnett. Poultry: Mr. H. F. Stocker and Mr. Turner.

Mr. George Darby, of Marklye, Warbleton, was unanimously elected a vice-president for Sussex, in the room of Sir J. Villiers Shelley, Bart., deceased.

The council then adjourned to Wednesday, April 10.

FARMERS' COWS.

In most parts of the kingdom where dairy farms are almost unknown, it is the common custom for all farmers to keep a few cows, generally from two to six or eight. If more are kept, it is considered to be a rather large dairy for an ordinary farmer. These cows are partly kept for family service; but they are chiefly designed to keep up a fair amount of cattle upon the farms, as also to produce a little income for the farmer's wife. It is upon the management of such small herds of cows, and such small dairies, that I desire in this short paper to offer a few plain remarks.

These small dairies are for the most part managed so as to meet the demand for their produce in their immediate locality, or of the neighbouring market town. Such dairy produce is seldom exported out of the district by the farmer; country shopkeepers, market women, or the town housekeepers being their principal customers. These market-women attend many country markets, and buy up butter, &c., for transmission to the larger towns, and frequently prove to be the best customers. Some of these small herds are kept to supply the country towns with milk, and it is a rather difficult problem to solve—*i. e.*, which is the most profitable appropriation of the cows' milk, in dairying or milk-selling? Of course much depends upon the proximity to the town in the latter case, and the demand for milk. Butter is at all times saleable, or it will keep an indefinite time; not so with milk. If not sold it is reserved for dairying; but, as the quantity thus left over is irregular, it is impossible to make the best of it, much of it going to pigs or young calves. The milk-seller should be able to quit his stock daily, or some loss accrues. The sale of milk has its peculiarities. Adulteration, by adding water, &c., is unblushingly practised by numbers. By others the produce of the evening's milking is often left till morning; it is then skimmed and warmed, and sold as morning's milk. The same course is pursued with the morning's milking, and is sold as evening's milk. The sale of pure new milk is not very remunerative. Customers are reluctant to pay its full value; hence, they are wronged through adulteration. Pure new milk is at this time currently sold by the London dairymen at 5d. per quart. In the country towns the same is selling at 2d. per quart. This is not enough; hence, a great scarcity of milk-sellers in the country, and more particularly of new milk.

We will try and show the comparative value of each course in a country town. A good average lot of dairy cows should yield, if well kept, and are properly milked, eleven quarts each per day. Eleven quarts of new milk at one penny per pint is 1s. 10d. per day, or 12s. 10d. per week. A quart of good new milk will yield 1½ oz. of butter, or 16½ oz.—say, for our purpose, 1lb. of butter daily, or 7lbs. per week, at an average price of 1s. per lb. = 7s. The skim milk at one penny per quart, deducting near one-third for creaming, &c., leaving eight quarts for sale, or 8d. per day = 4s. 8d.—together equalling 11s. 8d. per week. Generally there is but a dull sale for old milk, and in summer it is scarcely saleable; so that if we take the two courses to be about equal in the winter, the sale of new milk in the summer will obtain a considerable advantage. It would appear that the best practice for milk-sellers would be to keep an ample supply for customers, and what is left over from the sale of each "meal of milk" must be put into the creaming vessels to stand for cream and subsequent churning. There is some difference in the expense of disposing of new milk compared with the sale of old. New-milk sellers have for the most part to wait upon customers in daily rounds; old-milk sellers avoid that trouble by sales at the kitchen-door. Old milk only grows older—if not sold at once, it can be kept; new milk must be sold new. To the buyer or consumer the purchase of new milk must be preferable: only let it stand awhile, and the rising or deposit of cream is very serviceable for the family—besides so many are the uses to which new milk can be put, for which old is not applicable. The relative price too is unequal. New milk should command a higher price proportionately than I have in comparison shown, or where is the cost of selling to be derived? The milkman would have to travel over his district twice daily; this could not occupy less than half his day, if he has to sell the produce of some six or eight cows, which would amount to 1s. 3d. to 1s. 6d. per day, or from 8s. 9d. to 10s. 6d. per week, entailing an expense of about one farthing per quart, from which, taking all things into consideration, I am of opinion that good, genuine new milk cannot be afforded under threepence per quart. One of the most important of these considerations is the depreciated value of the cow, and which we will now look at. An average in-calf cow is well worth £20; the same cow, as a "drape cow," in nine months would be bought at £14 to £15; depreciated value, £5 to £6. Suppose she has produced during that time (*i. e.*, 40 weeks) 11 quarts of milk daily, = 3,080 quarts, which, at 1½ farthings per quart, would amount to £5 4s. 2d., the depreciated value of the cow. Here we see, then, that the cost of selling, and the depreciated value of the cow, would amount to one half-penny and a half-farthing per quart. The wear and tear of utensils and the depreciated value of the cow would be the same, whether kept for butter or for sale of milk.

Having gone so far into detail (petty detail) as to the comparative value of each course or practice of cow-keeping, we will now say a few words upon this order of cow management.—1st, calving: The in-calf cow should be well kept, and with great regularity; at calving time to be carefully watched, and plenty of time given before taking the calf away, except from false presentation; the calf should remain with the cow for at least two or three days, or, in fact, till the milk will bear the criterion of boiling. Both calf and cow are benefited by this course. If the calf fails to appropriate all the milk, the cow should be milked. The calf should continue to have about two quarts morning and evening of new milk, on its being first taken from the cow, to be gradually reduced to old milk, properly boiled and cooled, not merely warmed, as it will thus cause scouring.—2nd, general management of the cows: The pasture ground intended for the cows should be "laid in" from the 1st of March, so that they may be turned into it as early as possible in the spring. If the land is not of truly good character, they should have 4lbs. of cake daily. The pasture should be near to the milking shed, so as to avoid travelling far, which is highly detrimental to milch cows. They should be milked twice daily, and at equal intervals of time, say at five o'clock morning and evening. A "new bear" cow should be milked thrice daily for a short time. As the summer advances, and the pasturage shows signs of some disinclination of the cows to eat it, they should be shifted into other pasture for a time, and other stock be put in to eat it off, or it may be "hobbed" off by the scythe, when on their return these will be the very places they will resort to for the most palatable pasturage. In the autumn they should have the first run of the eddish, and on which they might be kept daily till winter approaches, provided they are housed or put into warm yards for the night, and are supplied with hay or other dry food and a ration of cake. When the cold weather sets in they must be altogether kept up; their food should consist of hay, half a bushel of mangels, and from 4 to 6lbs. of linseed or cotton cake daily through the winter. The latter is said to be quite equal to linseed-cake for the production of milk. The water supplied should receive special attention, so that it is always pure and free from taint. It will add to their well-doing and profitable milking properties if they are well rubbed or wisped down daily. Cleanliness is indispensable.—3rd, breeding: It is not desirable to permit cows in full profit to take the bull too soon, even if urgently inclined. Being in-calf speedily reduces their milk. Probably about the fourth or fifth month after calving is the proper time, according to the cow's produce of milk. A cow generally ceases to be profitable as a milker after the fifth calf, but some old cows are exceptions; therefore the farmer must be his own judge as to their profitable breeding. To keep up a stock of eight milking cows in full profit, the farmer should have five or six "in-calvers coming in." Some of the drape cows might be readily made to rear young calves, although unprofitable as milkers. This is, upon the whole, an admirable way of keeping up a numerous and profitable herd of cattle upon the farm, the young cattle supplying the place of drapes.

P. F.

THE MANAGEMENT OF LAMBS.

At a general meeting of the members of the Wakefield and West Riding Farmers' Club, Mr. Brady Nicholson, of Stourton Grange, near Leeds, read a paper on "The Best Management of Lambs after Weaning." He said that the subject he had chosen to address them upon was one of the greatest importance to all breeders of sheep, for generally the greatest loss in lambs occurs from the time of weaning to the time when they are placed to feed upon turnips. The loss is not alone in the deaths of the animals, but in the great deterioration in their weight and condition; and he had no doubt that that day there were thousands of lambs in England which, in consequence of mismanagement and disease, weighed very little more than they did on the day when they were separated from their dams. Farmers should use the greatest foresight and care in this important matter, and he presumed, considering the present "go-a-head" age, and the desire to produce animals in the greatest perfection ready for the market at the earliest period, that breeders must have given their ewes and lambs artificial food during the time of suckling; but if such had not been the case prior to weaning, he would most certainly recommend that the animals should be taught to eat artificial food as soon as they are removed from their dams. Mr. Nicholson impressed upon those present that it is most essential to their future success that the animals should perfectly learn this part of their education, and then said that it is impossible to have fat hoggs in the spring if they started with poor, weak, and unhealthy lambs in the autumn. The artificial food that he would recommend was a compound consisting of two parts malt (if the tax was only repealed), two of green cotton cake, one of linseed, one of bran, two of locust meal, and two of malt coombs, giving the animals the compound twice a day in such quantities as they would eat. The pasture to place lambs in after they had forgotten their dams should be a second crop of red clover, sufficiently old, then tares or rape, cabbages planted in February, and turnips sown in April. If they were not plagued with game, an acre of cabbages planted in February would be ready for pulling in July and August; and the more changes of food the animal had, the greater would be the rapidity with which they would gain flesh. If they had grass which was not too rich and luxuriant, and the season was dry, they might change them on to it; but in very dry seasons there is not much danger, it being the continuous wet weather that is the cause of the mischief. After saying that they should avoid weaning unless they had a course of food in preparation so as to carry the lambs forward to turnips, Mr. Nicholson went on to remark that some years the animals commence dying when sucking the ewes, but this is seldom the case provided they have artificial food as well as a good supply of salt to run to. After separating the lambs from the ewes, and having got some food ready for them, he generally dipped the lambs as soon as weaned. For dipping he recommended 1lb. of arsenic, 1lb. of carbonate of potash, and 1lb of soft soap; the arsenic, potash, and soft soap being boiled, and then a sufficient quantity of water added. Should the lambs be struck with fly, the best remedy was mercurial ointment run in a circle round the maggots, which were killed by it. Caps should be placed upon all lambs that had any tendency to sore heads; and if the head was sore, a dock leaf might be placed under the cap. If they had the scab among their sheep he advised them to procure one gallon of tobacco juice, which would cost 10s., and to add to it 15 gallons of warm water and a pint of oil of tar to the score, with about 2lbs. of common salt. They should be cautious when they first stocked a pasture that the food was dry, particularly if it was red clover, and they should not keep the lambs too long upon it for the first few days. They should also use the greatest care not to let the lambs fall back upon the over-eaten land, particularly if it has been cropped close and strikes up again in a few hours, for that sort of food would bring on diarrhœa. Lambs should never be allowed to be depastured upon new seeds after the corn had been taken off, but they should be got upon turnips as soon as possible, a few being placed upon the pasture where they are feeding, and ten or twelve old sheep put with them to teach the lambs to bite the turnips. If the turnips were luxuriant in the top they should be pulled a day or two before being given to the animals, and after about a fortnight of this treatment the animals would be ready to be placed upon turnips, and if afterwards their food was cut, and the plans which he had suggested were adopted, health, success, and rapid improvement would be the result. If any of the gentlemen present had no red clover, if their grass was unsuitable for lambs, and was not turnip land, theirs were not breeding farms; but, if persons so situated were determined to try breeding, he advised them to sell their lambs to the butcher before weaning. After remarking that if the season were a wet one, feed upon a wrong pasturage would be attended with disastrous results, Mr. Nicholson gave an instance of the result of a wet summer, and the want of proper food, that had come under his own observation; and after giving another instance of a somewhat similar character, in both of which the losses of the farmers had been enormous, he said that he was happy to say that out of 540 lambs he had not lost twenty. With respect to the treatment of disease, he recommended the removal of the animals from the disastrous pasture into a lane where there are plenty of briers; for they would eat the young leaves and young shoots with avidity, and they would receive much benefit. If they had not a lane, briers, small oak boughs with the leaves upon them, and larch tops might be spread about the field, and they would also prove beneficial. Mr. Nicholson then gave some recipes for mixtures which he said he had used with great success; strongly recommended the use of cod-oil, which is 5s. a gallon; and, after giving some particulars with respect to his system of feeding with turnips, he proceeded to say that under the method he had placed before them he had produced at an early age animals as good as most men in Yorkshire, upon land that is not good for sheep, having a bad airage. The animal that he recommended to breed for profit and early maturity was a cross with a Leicester ram and a Lincolnshire ewe; for he considered that cross would produce the greatest quantity of wool and mutton at an early age.

THE LAW OF HYPOTHEC IN SCOTLAND.

At last a Bill has been introduced into the House of Commons by the Lord Advocate of Scotland, "to amend, not abolish, the law relating to the landlord's right of hypothec in Scotland, so far as respects land held for grazing or agricultural purposes." The provisions of this Bill, which was read a first time in the House of Lords, may be summarized as follows.

1st. This Act applies to Scotland only.

2nd. It applies only to land with the buildings thereon occupied for farming purposes, and not to houses in towns or in rural districts, the tenants of which will still be subject to sequestration.

3rd. When corn or other agricultural produce has been *boná fide* purchased and paid for and actually delivered, the right of hypothec of the landlord over such produce shall cease and determine, provided the said produce has not been removed by the tenant before completing the sale, in which case the landlord retains the right of sequestration over it for the rent due.

4th. Unless the proceedings against a tenant for rent due are not commenced within three months after it is payable, according to the terms of the lease or agreement, &c., the right of hypothec for rent shall cease.

5th. In the event of grazing stock of any kind taken in for grazing and feeding, the landlord to have a right of hypothec over it, only to the extent of the payment agreed upon between the owner and the tenant for such grazing and feeding, and no further, the said right to continue so long as any part of the said payment continues unpaid, in which case the cattle or sheep shall be liable to seizure for the amount still remaining unpaid. Or in case of fraud or collusion between the owner and the tenant, the landlord shall then have the right of hypothec over such cattle to the full extent of the rent due.

6th. Household furniture and agricultural implements not liable to sequestration, nor any imported manure, drain-tiles, or feeding-stuffs, not the produce of the farm, except it has been procured to be used in fulfilment of the conditions of the lease, in which case it may be seized under the law of hypothec.

7th. A register of sequestrations to be kept at the Sheriff's or some other Court, in which shall be entered any sequestration for rent granted by the Court; and any person applying may search the register, on payment of one shilling, during the office-hours of such days as the Sheriff's clerk or other officer of the Court shall attend.

Such are the terms on which the Lord Advocate proposes in future to place the relations of landlord and tenant in Scotland; but we very much doubt whether the more intelligent of the Scottish tenantry will be satisfied with this Bill, or anything short of an entire abolition of the very principle on which the law or custom of hypothec is based—namely, that of a priority of right of the landlord, over every other creditor, to the payment of the last farthing. The law of sequestration over the whole of a tenants' property will still exist in all its force, so far as the rent due extends; the restriction to three months for its application being no security, as the landlord or his agent will take special care that action will be taken before that term is expired, in case of a default. The obligation to register the sequestration is an improvement; as is also the exemption, in case of grain or other produce being *boná fide* paid for and delivered. But this is only saying that a Scottish landlord can no longer commit any injury by law; for, as the law of hypothec now stands, we have no hesitation in saying that the man who exercises such a *wrong*, avails himself of an unrighteous law to plunder a man entirely innocent of any offence or crime. There is, therefore, no more merit, in a moral sense, in thus tying the hands of hard Scottish landlords than there is in making highway robbery a penal offence. We wish the Scottish landlords could see this in the same light as the majority of those in England do, and they would rejoice that such monstrous powers are to be taken from those who are so ready to exercise them.

The most, therefore, that we can say in favour of the Bill is that it is an improvement upon the state of the law as it at present stands; but it adheres nearly *verbatim* to the propositions agreed upon by the committee appointed by Her Majesty to inquire into the subject of the law of hypothec. There were, however, four dissentients from the report of the committee, two of whom—Messrs. Carnegie and Young—thought that greater changes ought to have been made; whilst Messrs. G. Hope and Curror were of opinion that the greatest evils of the law are left by it untouched, and that nothing but the total abolition of the law was consistent either with justice or expediency.

We shall see, when the second reading of the Bill is proposed, what the Scottish peers have to say about it. This, however, is not the time for landowners, or any other of the higher classes, to stand up for exclusive privileges under an unrighteous law. The Scottish tenant farmers are now well aware of the utterly untenable arguments held in favour of the continuance of the law, urged by those who have a direct interest in it. Nor do we believe that they will rest satisfied with the modifications proposed by the framers of the Bill. The injurious effects of the law in preventing a tenant farmer from obtaining accommodation from his banker is of itself one of the most powerful arguments in favour of a total abolition of the law. A banker formerly required only two respectable securities, with that of the borrower, to advance a sum of money to a young farmer; but as the laws of hypothec and sequestration have been exercised of late, few men will venture to give security for money which they will probably be called upon to pay themselves; and, on the other hand, the banker will look sharply that the offered bondsmen are not themselves under sequestration, which is in many cases a very probable occurrence in these days of Scottish high-rented farms.

The only measure that can give permanent satisfaction, and do equal justice to all concerned, is the entire abolition of the present privileges of the landlords, placing them upon the same commercial footing as other dealers. There is nothing in the possession of land that can justly entitle its owner to a preference over other creditors of a tenant. The only thing in which he differs from a merchant is that his capital always remains intact, while that of the merchant is liable any day to be not only lessened, but wholly dissipated by reverses in trade. On the other hand, the landlord, supposing the law of hypothec and sequestration abolished, can share with other creditors in the loss involved in the failure of a tenant; but he can lose nothing by depreciation of stock or capital. A merchant risks his whole capital in the credit he gives, and from being a wealthy man to-day he may be destitute of a shilling to-morrow, without any fault of his own. On the other hand, the landowner risks nothing in letting his land to a tenant but the rent, and in this he shares in the loss, in case of a failure, with other creditors, or, at least, he ought in justice to do so. His position as a landowner gives him no moral right of priority in the claim upon the estate of an insolvent tenant. All that he has a just right to is an equal share of the property on the farm. This is the principle proposed by Messrs. Hope and Curror, and we have heard no arguments from others that have any validity in favour of these most obnoxious and unjust laws.

THE CONDUCT OF HORSE SHOWS.

So soon as twelve or two o'clock comes, so surely do the people gather round the horse-ring. The shorthorn breeders fairly forsake the prize bull, Captain Davy turns his back on the Devons, and Mr. Stearn, for the nonce, becomes oblivious of the white sow and her wonderful litter. Even the implement makers desert their stands, for, as one of them confessed to me, "It is of no use our stopping here while the horses are out!" Care, then, should be taken, in the first instance, to provide a good roomy ring, the larger the better, in which two or three classes, if found necessary, may be exhibited at the same time, but, above all, with the object of giving the spectators plenty of space to dispose themselves at the sides. As a rule, the rings, however equal to the business of judging, are too small for the afternoon parade, when the crowd has increased and comes to a focus hereabouts. In the next place, the horses should enter strictly according to their numbers on the catalogue, while these should be plainly discernible on *each* side of the animal's head. The parchment label soon curls up, and the best insignia of the sort I have seen are small metal plates, with the black figures painted on a white ground. These, of course, could be returned at the close of the meeting, and made use of year after year. I hold it, however, to be very essential that the horse should have his number on either side, as this plan must save a deal of trouble in the way of cross questions and crooked answers, for a man naturally gets sick of saying this is "one hundred and twenty-five" a hundred times over, particularly if he has not taken a prize. The prize horses must be further distinguished by winning colours, and it would be very convenient if the societies of the kingdom would agree to some uniform recognition of what these rosettes should stand for. Let us say *purple* for first, *crimson* for second, and *green* for third. Any lighter hues, such as pale blue, white, or yellow, soon become discoloured, especially in wet weather, when they are not easily noticed. Some years since I recommended the use of a telegram board, something similar to that on race-courses, upon which the winning numbers should be placed so soon as a decision was arrived at, and this plan is now adopted at the Yorkshire Agricultural Society's meeting, and also in the Agricultural Hall. If, however, the colours be given out at the time, there is not so much call for the telegram, and indeed I suggested its use rather where the ribands were *not* handed over, as was then the case with one or two of our leading societies. Further, no horse should be suffered to leave his box out of his turn or his class, for if such a privilege be granted to one, others will be sure to claim it, and the whole business quickly come to confusion.

Of perhaps the most popular feature of the horse show, that is the "jumping" of the hunters, I hardly know how to speak. It may sound like affectation, but, for my own part, I would prefer to judge a hunter without seeing him jump in the ring rather than after going through such a performance. As a matter of proof it really stands for little or nothing. Old seasoned hunters would be many above such a business as charging hurdles twenty times in succession, and for young horses the test is still more unfair, with thousands of people shouting and yelling in their faces, and none of the legitimate incentive of hounds running to carry them over their fences. One of our best judges recently paid me the compliment of asking me how they should act in a difficulty of this kind, "We should give the chesnut horse the prize if he would only jump;" to which I answered, "Give him the prize first, and see if he will jump afterwards"—as, with much persuasion, he eventually did. Still there is no denying but that such a placard as that "The hunters will be jumped at one o'clock" draws the public, and if this said jumping were confined to the hunters, there would be no great harm done. But with the jumping the great Order of Misrule too often commences, and it would be almost impossible to do justice to some of the "scenes" of this sort that have occurred during the past summer. Let the bushed hurdles be only once put up, and everybody straightway does anything he chooses. Horses that will and horses that will not fence, ponies, cobs, colts, harness horses, and I am not quite certain but that some of the stallions, were all in the ring at the same time, and valiantly ridden at "the leaps." The very stewards joined in the fun, which created a deal of laughter certainly, but was about as great a burlesque upon the business of a horse show as it would be possible to imagine. It is significant that in the rules of the Yorkshire Agricultural Society there is one prohibiting the jumping of horses upon any pretence whatever; and I would not recommend the West of England Society to introduce such an attraction, even if the Council should extend the classes of hunting horses.

Co-equal in importance with the appointment of stewards must be the selection of judges, and, as a principle, it is better that these should come from a distance. It is rarely that a man can give satisfaction when he is busy over his own friends' and neighbours' entries, and where the award is often enough attributed to the influence of some interested feeling or assumed partiality. It would, of course, be next to impossible to nominate any man but who would recognise some of the animals brought before him, though the less he knows of them the better, and for this reason I do not advocate the more recent plan of placing the complete catalogue, with the names of the owners and horses, in the judges' hands. Many a timid or otherwise incompetent man might be induced to act with such information at his command, and in one or two cases these full particulars have had a deal more to do with the decision than anything else. It is even something to say that this cob belongs to the celebrated Mr. So-and-So. The services of the veterinarian I have always advocated; that is, in his proper place as an inspector, but not as a judge. The very education of this gentleman prompts him to look rather for flaws than beauties, and, like Mr. Weller, his "wision is limited." The horse-dealer, again, is a still more objectionable authority. He is, the rather, a little too knowing in his way, while his only standard of excellence is that

> "The real value of a thing
> Is just as much as it will bring;"

and his invariable argument, "Well, I only know that I would give more for this horse than for any of the others," without often condescending to look into the conditions of the class. I remember once getting taken to task in the Eastern Counties for putting aside—"never noticing," as he said—two dealers' horses that he declared "were worth all the others put together." And very possibly, as they were a pair of great, banging, young carriage horses, entered for a premium which was at any rate intended to be given to the best *hack!* I have also seen the first prize for a stallion to get cobs and ponies duly awarded to a coach-horse standing nearly sixteen hands high, with two out of the three judges in "the profession;" and apparently for no other reason than that this animal's money value to sell again was greater than that of any of the clever cobs in the class. "I should never do for a judge," I once heard a London dealer remark, with a pride that aped humility, as he hung over a coarse, under-bred beast that he no doubt knew where to place, but that had *not* been selected as the best specimen of a modern hunter. And he was right, for if this was his ideal he would have not done for a judge. Dealers, buyers, or agents, are still more out of place in the ring, particularly when called upon to officiate in districts which they are in the habit of visiting, and I have heard a good story of how one of these commissioners said to his colleague, "We'll give this mare the prize, and I'll go and buy the other!"—From a Paper by Henry Corbet in the new Number of the *Bath and West of England Society's Journal.*

STALLIONS FOR THE SEASON, 1867.

[NONE BUT THOROUGH-BRED HORSES ARE GIVEN IN THIS LIST].

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. Winners out by	Sire of	Standing at	Apply to	Price.
A. 1	brown	5	by Sweetmeat, out of Juanita Perez, by Melbourne	never appeared	—	—	—	Port Paddocks, Ruan, Clare	—	3 sovs., h. b. 2 sovs.
Adamas	bay	12	by Touchstone out of Ada Mary, by Bay Middleton	started 22, won 6	ran third for the Derby	7	Corinthian Tom	Tooting Common, Surrey	Mr. Smith	10 gs.
Adventurer	bay	8	by Newminster, out of Palma, by Emilius	started 18, won 8	won Queen's Vase, Ascot	untried.	—	Sheffield Lane Paddocks	F. Croft	20 gs.
Amsterdam	bay	12	by The Flying Dutchman, out of Urania, by Idle Boy	started 48, won 14	won Chesterfield Plate	4	Halifax	Easby Abbey, Richmond	Mr. Boone	15 gs.
Ancient Briton	chesnut	12	by Cotherstone, out of Ellen Horn, by Redshank	started 28, won 4	won Liverpool Cup	—	—	Bromyard, Hereford	Messrs. Devereux	6 gs., h. b. 3 gs.
Angelus	chesnut	7	by Orpheus, out of Nutmeg, by Nutwith	started 5	—	—	—	Newton, near Malton	The groom	10 gs., h. b. 3 gs.
Arthur Wellesley	bay	16	by Melbourne, out of Lady Barbara, by Launcelot	started 7, won 1	won Two-year-old Stakes at Manchester	10	Arcadia	Rawcliffe, York	Mr. Martin	15 gs.
Artillery	bay	14	by Touchstone, out of Jeanette, by Birdcatcher	started 21, won 7	won the Criterion	33	Redan	Lark Lodge Stables, Curragh	—	10 sovs.
Asteroid	bay	9	by Stockwell, out of Teetotum, by Touchstone	started 12, won 7	won Chester Cup	untried.	—	Newmarket	Messrs. Barrow	50 gs.
Atherstone	brown	9	by Touchstone, out of Lady Harriet, by The Merry Monarch	started 42, won 16	won the St. Liz Handicap	untried.	—	Hurstbourne Park, in Whitchurch	The groom	15 gs.
Autocrat	bay	15	by Bay Middleton, out of Empress, by Emilius	started 5, won 3	won the New Stakes	16	Bubbles	Lymington	Mr. Thorn	10 gs., h. b. 5 gs.
Bacchus	brown	6	by Claret, out of Mona, by Polish or Mickey Free	started 11, won 3	won £1,340 (h) Newmkt.	untried.	—	Newmarket	Messrs. Barrow	10 gs.
Barabbas	black	10	by Jericho, out of Miss Goldschmidt, by Ion	started 8	—	untried.	—	Kilmallock, Limerick	—	4 sovs.
Barbarian	bay	18	by Simoom, dam by Buzzard	started 5, won 1	ran second for Derby	10	Peri Colt	Nrth. Grimston, Malton	Mr. Harrison	5 gs., h. b. 2 gs.
Bedminster	bay	5	by Newminster, out of Secret, by Melbourne	started 5, won 2	won Prendergast Stakes	—	—	Dewhurst, Wadhurst	T. Petler	10 gs.
Ben Webster	bay	10	by Barnton, out of Bassishaw, by The Prime Warden	started 31, won 9½	won Chester Cup	untried.	—	Livery Stables, York	Mr. Ellerington	5 gs.
Bird on the Wing, brother to	black	14	by Birdcatcher, out of Prairie Bird, by Touchstone	started 16	—	4	First Flight	Doncaster	Mr. Cunningham	15 sovs.
Black Down	chesnut	7	by Rattle, out of Subtlety, by Flatcatcher	started 14, won 2	won Goodwood S.	untried.	—	Longworth, Farringdon	Mr. J. Brewer	12 gs., h. b. 6 gs.
Blair Athol	chesnut	6	by Stockwell, out of Blink Bonnie, by Melbourne	started 6, won 5	won the Derby	untried.	—	Fairfield, York	Mr. Jackson	100 gs., full.
Blarney	chesnut	6	by Claret, out of Mag on the Wing, by Magpie	started 7, won 6	won £320 at Shrewsbury	untried.	—	Roxborough, Moy, Irld.	—	5 gs., h. b 3 gs.
Blue Mantle	bay	7	by Kingston, out of Paradigm, by Paragone	started 60, won 9	won Ascot Biennial Stks	—	—	Rawcliffe, near York	Mr. Martin	10 gs.
Bobadil	bay	9	by Newminster, out of Moresca, by Don John or Iago	started 22, won 3	won Goodwood Stakes	untried.	—	Henley-on-Thames	W. Strange	2 sovs.
Bonnyfield	bay	7	by West Australian, out of Queen Mary, by Gladiator	never appeared	—	untried.	—	East Barnet, Herts	—	15 gs.
Brocket	bay	17	by Melbourne, out of Miss Slick, by Muley Moloch	started 7, won 3	won Royal Hunt Cup	8	Sir Hugh	Mamhead, Exeter	Mr. Massie	10 gs.
Brown Dayrell	brown	5	by Wild Dayrell, out of Postulant, by Cowl	never appeared	—	—	—	Four Oaks, Sutton, Brm.	Jas. Lagoe	10 gs.
Cambuscan	chesnut	6	by Newminster, out of Arrow, by Slane	started 13, won 7	won July Stks., Newmkt	untried.	—	Park Paddks., Newmkt.	Mr. F. Dawson	20 gs.
Camerino	bay	9	by Stockwell, out of Sylphine, by Touchstone	started 41, won 7	won Doncaster Stakes	untried.	—	Rawcliffe, York	Mr. Martin	15 gs.
Cannobie	bay	14	by Melbourne, out of Lady Lurewell, by Hornsea	started 5, won 2	won Metrop. Handicap	17	Pamunkey	Cawston, Rugby	Stud groom	10 gs.
Cape Flyaway	brown	10	by The Flying Dutchman, out of Canezou, by Melbourne	started 29, won 13	won Doncaster Stakes	untried.	—	Knowsley, Prescot	Mr. T. Forshaw	10 gs.

Caractacus	bay	8	by Kingston, out of Defenceless, by Defence	started 9, won 8	won the Derby	untried.	—	Highfield Paddocks, nr. St. Albans	Mr. C. Snewing	20 gs. Full.
Carbineer	bay	9	by Rifleman, out of Comfit, by Sweetmeat	started 14, won 4	won Newmkt. H., £1,095	untried.	—	Aske, near Richmond	Stud groom	10 sovs., h.b. 5 sovs.
Caterer	bay	8	by Stockwell, out of Selina, by Orlando	started 3, won 1	won Findon Stakes	untried.	—	Neasham, near Darlington	Mr. T. Sedgwick	16 gs.
Cathedral	chesnut	6	by Newminster, out of Stolen Moments, by Melbourne	started 10, won 3	won Gt. Nrthrn.H., York	untried.	—	Middlethorpe, York	Mr. Smallwood	10 gs.
Cavendish	brown	11	by Voltigeur, out of The Countess of Burlington, by Touchstone	started 3, won 1	won Convivial Stakes	5	Easby	Middleton - One - Row, Darlington	Mr. Parrington	12 gs.
Cawood	bay	11	by The Cure, out of Brandy Snap, by Muley Moloch	started 11, won 1	won a Plate at Newton	2	Stapenhill	Measham, Atherstone	—	5 gs., h. b. 2½ gs.
Cellarius	bay	7	by Fandango, out of Hybla, by The Provost	started 27, won 8	won £100 at Brighton.	untried.	—	Royston	Mr. A. Fisher	7 sovs., h. b. 3 sovs.
Change	chesnut	7	by Weatherbit, out of Miss Aldcroft, by Ratan	started 19, won 3	won £375 (h) at Reading	untried.	—	Tuam	—	4 sovs., h. b. 2 sovs.
Chevalier d'Industrie	chesnut	13	by Orlando, out of Industry, by Priam	started 14, won 3	won the Gratwicke	9	Fripponier	Swalcliffe, nr. Banbury	Mr. Gulliver	20 gs.
Citadel	chesnut	8	by Stockwell, out of Sortie, by Melbourne	started 5, won 2	won P. of WalesSt., Nmkt.	untried.	—	Newmarket	Mr. F. Dawson	25 gs.
Clapham	chesnut	11	by Stockwell, out of Little Fairy, by Hornsea	started 8	—	untried.	—	Bonvilstone, Cardiff	Mr. Griffiths	5 gs.
Claret	brown	15	by Touchstone, out of Mountain Sylph, by Belshazzar	started 27, won 8	won G. Duke Michael	12	Blarney	Rawcliffe Paddocks	Mr. Martin	15 gs.
Clonmore	brown	6	by Duc an Dhurrus, dam by Sleight-of-Hand	never appeared	—	—	—	Roxboro', Moy, Tyrone	—	2 sovs.
Colonist	bay	13	by Melbourne, out of Forget-me-Not, by Hetman Platoff	started 2	—	2	Dora	Castle Waller, Tipperary	—	7 gs., h. b. 3½ gs.
Colsterdale	brown	19	by Lanercost, dam by Tomboy	started 32, won 7	won Liverpool Cup	32	Lecturer	Sheffield-lane Paddocks	F. Croft	20 gs.
Colt, A	chesnut	3	by Newminster, out of Canezou, by Melbourne	never appeared	—	—	—	Rawcliffe	Mr. Martin	5 gs., h. b. 2½ gs.
Commotion	bay	13	by Alarm, out of Dinah, by Clarion	started 25, won 8	won the Woodcote Stakes	6	Cutaway	Ravensden, Bedford	—	10 gs.
Confessor, The	bay	18	by Cowl, out of Forest Fly, by Mosquito	started 8, won 2	won Gt. Yorksh. Handicap	12	Cock-a-hoop	Tinvane, Carrick-on-Suir	—	5 sovs., h. b. 3 sovs.
Costa	bay	8	by The Baron, out of Catherine Hayes, by Lanercost	started 26, won 7	won Chesterfield Stakes	untried.	—	East Acton, Middx.	Mr. Donald	10 gs.
Count, The	bay	6	by Stockwell, out of Countess of Albemarle, by Lanercost	started 30, won 5	won £64 (h) at Beverley	untried.	—	Wistow, Selby	Mr. S. Schaley	7 gs, h. b. 2½ gs.
Crater	bay	10	by Orlando, out of Vesuvienne, by Gladiator	started 11, won 3	won the Ascot Stakes	untried.	—	Mamhead, Exeter	Mr. Massie	30 gs.
Daniel	bay	11	by Newminster, out of Lioness, by Ballinkeele	started 43, won 10	won Qn.'s Plate, Carlisle	untried.	—	Kilminchy, Maryboro'	—	4 gs., h. b. 2 gs.
De Clare	bay	15	by Touchstone, out of Miss Bowe, by Catton	started 4, won 3	won Newmarket Stakes	15	Klarinska	Knowsley, Prescot	Mr. T. Forshaw	10 gs., h. b. 5 gs.
Defender	bay	11	by Windhound, out of Ellen Horn, by Redshank	started 37, won 6	won £275 at Chester	untried.	—	Upr. Lambourne, Berks	J. Drisbane	15 gs.
Diophantus	chesnut	9	by Orlando, out of Equation, by Emilius	started 10, won 6	won the 2,000 gs. Stakes	untried.	—	Stud Farm, Enfield	Mr. H. Goodchild	15 gs.
Don John	bay	9	by Wild Dayrell, out of Circassian Maid, by Lanercost	started 39, won 8	won £106 at Reading	untried.	—	Leggan Hall, Ireland	—	5 gs., h. b. 3 gs.
Donnybrook	bay	7	by Sprig of Shellelagh, out of Fly, by Iago	started 35, won 8	won £380 (h) at York	—	—	Moorland's Std Frm, Yk	—	5 gs., h. b 2½ gs.
Drumour	chesnut	13	by Big Jerry or Weatherbit, out of Elspeth, by Irish Birdcatcher	started 10, won 2	won the July	4	Dunkeld	Bay Thorpe, Chesterfield	H. Bird	10 gs., h. b. 5 gs.
Dundee	bay	8	by Lord of the Isles, out of Marmalade, by Sweetmeat	started 8, won 6	Second for the Derby	7	Marksman	Croft, Darlington	Mr. Winteringham	30 gs.
Dupe	brown	17	by Pantaloon, out of Decoy, by Filho da Puta	never appeared	—	6	Marabout	Mamhead, Exeter	Mr. Massie	20 gs.
Eglinton	bay	5	by De Ruyter, out of Din, by Storm	never appeared	—	—	—	Addington, Croydon	Mr. Walker	3 gs.
Eidolon	bay	10	by The Flying Dutchman, out of Black-eyed Susan, by Faugh-a-Ballagh	started 67, won 14	won Granby Handicap	untried.	—	Leggan Hall, Ireland	—	5 sovs., h. b. 2 sovs.
Ely	bay	6	by Kingston, out of The Bloomer, by Melbourne	started 30, won 19	won Ascot Cup	untried.	—	Hampton Court	Mr. Ransome	50 gs.
Exchequer	chesnut	8	by Stockwell out of Stump, by Emilius	started 38, won 8	won £400 at Newmarket	untried.	—	Clumber, Worksop	Mr. W. Scott	10 gs.
False Alarm	chesnut	5	by Trumpeter out of Treacherous, by Pantaloon	started 2	—	—	—	Hasketon, Woodbridge	Isaac Smith	5 gs., h. b. 2 gs.
Fingal	brown	11	by Mountain Deer, dam by Ismael	started 6, won 2	won the Anglesea Stakes	untried.	—	North Grimston, Malton	J. Harrison	5 gs., h. b. 2 gs.
First Flight	chesnut	6	by Brother to Bird-on-the-Wing, out of Physalis, by Bay Middleton	started 3, won 1	won Prendergast Stakes	untried.	—	Doncaster	Mr. Cunningham	10 sovs.

STALLIONS FOR THE SEASON 1867—(*Continued*).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by	Sire of	Standing at	Apply to	Price.
Fitz-Roland	chesnut	12	by Orlando, out of Stamp, by Emilius	started 15, won 3	won 2,000 Gs. Stakes	3	Miss Roland	Leybourne, Maidstone	Mr. Tweed	15 gs.
Frogmore	bay	12	by Touchstone, out of Duchess of Kent, by Belshazzar	never appeared	—	2	The Orphan	Eastergate, nr. Burnham	Mr. C. Field	10 gs., h. b. 3 gs.
Fulbeck	bay	15	by Beverlac, out of Elfrida, by Elis	started 25, won 6	ran 2nd for Goodwd. Stk.	untried.	—	Whitchurch, Salop	Mr. Bell	10 gs., h. b. 3 gs.
Gamekeeper	brown	15	by Birdcatcher, out of Swallow, by Lanercost	started 53, won 10	won Chester Handicap	1	Dean Swift	Cavan, Ireland	Mr. May	5 sovs., h. b. 2 sovs.
Gamester	brown	16	by The Cossack, out of Caiety, by Touchstone	started 18, won 8	won the St. Leger	untried.	—	Belsay, Nwcstl-on-Tyne	T. Ewart	7 sovs., h. b. 3 sovs.
Gemma di Vergy	brown	13	by Sir Hercules, out of Snowdrop, by Heron	started 33, won 18½	ran second for Ascot Cup	26	Gem of the Sea	Mamhead, Exeter	Mr. Massie	20 gs.
Gemma Junior	brown	11	by Sir Hercules, out of Lady, by Orlando	never trained	—	1	Greyleg	Cotteridge, Kg's. Nortn.	—	5 gs.
General Hess	chesnut	10	by The Nabob, out of Lady Alice, by Lanercost	started 74, won 21	won St. Liz H., Nthmptn.	—	—	Althorpe, Northampton	Mr. Wilson	6 sovs., h. b. 3 sovs.
General Peel	bay	6	by Young Melbourne, dam by Orlando, out of Brown Bess	started 12, won 5	won 2,000 gs. Stakes	—	—	Doncaster	Mr. Cunningham	50 sovs.
Gladiateur	bay	5	by Monarque, out of Miss Gladiator	started 14, won 11	won the Derby	untried.	—	Middle Park, Eltham	Mr. Blenkiron	100 gs.
Glenmasson	bay	13	by Cotherstone, out of Annette, by Priam	started 11, won 5	won Stwd's. Cp. Goodwood	9	Jack in the Green	Warden, Biggleswade	T. Morgan	20 gs., h. b. 5 gs.
Granborough	chesnut	7	by King Tom, out of Giraffe, by Melbourne	started 10. won 4	won £900 at Newmarket	untried.	—	Mentmore, Lghtn-Bzrd.	C. Markham	5 gs.
Grey Plover	grey	16	by Birdcatcher, out of Whim, by The Drone	started 2	—	3	Plover, The	Mountainstown	—	2½ sovs.
Grimston	bay	8	by Stockwell, out of Miranda, by Lanercost	started 19, won 3	won £220 at Edinburgh	untried.	—	Swalcliffe, Banbury	Mr. Gulliver	10 gs.
Grinder	roan	5	by Volunteer, out of Titæa, by Ion	started 6	ran 3rd for Stockbrdge C.	—	—	Ravensden, Bedford	—	10 sovs.
Grosvenor	brown	19	by Touchstone, out of Miss Beverley, by Stockport	started 3, won 1	won Plymouth Vase	4	Wilton	Aldford, Chester	Mr. T. Parker	10 gs.
Guicowar	brown	17	by Galaor, out of Pharmacopeia, by Physician	started 22, won 4	won Northern Metropltn.	5	Empress	Hutton Cranswick, Driffield	J. Stockdale	10 gs., h. b. 2 gs.
Gunboat	brown	13	by Sir Hercules, out of Yard-arm by S. Anchor	started 18, won 8	won Cleveland Handicap	12	Monitor	Bushbury, Wolverhmpn	Mr. Daly	20 gs.
Harlequin	brown	8	by Voltigeur, dam by Melbourne	started 27, won 8	won £576 at Newmarket	untried.	—	Rufford Abbey, Allerton	R. Coultas	10 gs., h. b. 5 gs.
High Treason	chesnut	10	by Mildew, out of The Gipsy Queen, by Tomboy	started 19, won 5	ran second for Leger	untried.	—	Middle Park, Eltham	Mr. Blenkiron	15 gs.
His Excellency	chesnut	7	by West Australian, out of Maria, by Harkaway	started 4, won 1	won £60 at Abergavenny	—	—	Marl Hill, Cheltenham	Mr. W. Holman	5 gs.
Hollyfox	brown	6	by Voltigeur, out of Flax, by Surplice	started 19, won 1	Cleveland Cup, Huntgdn.	untried.	—	Stockton-on-Tees	J. P. Skeene	—
Hubert	bay	8	by Stockwell, out of Honeydew, by Touchstone	started 12, won 2	won £270 at Newmarket	untried.	—	Boynton, Bridlington	Mr. H. Horner	20 gs.
Hunting Horn	brown	13	by Surplice, out of Ferina, by Venison	started 1	won R A.S.E.'s prize for getting hunters	untried.	—	Woodgate, Wellington, Somerset	Mr. Hopkins	5 gs., h. b. 3 gs.
Ivanhoff	bay	9	by Muscovite, out of Blackbird, by Irish Birdcatcher	started 24, won 7	won Gt. Nrthrn. H., York	untried.	—	Marl Hill, Cheltenham	H. Thomas	10 gs.
Joey Jones	bay	8	by Newminster, out of Mrs. Dodds, by Birdcatcher	started 36, won 10	won Northumblnd. Plate	untried.	—	Middleton - One - Row, Darlington	Mr. Parrington	10 gs.
Johnny Armstrong	bay	8	by Annandale, out of Heather Bell, by Bay Middleton	started 23, won 8	won Gimcrack Stakes	untried.	—	Rawcliffe, York	Mr. Martin	10 gs.
Kettledrum	chesnut	9	by Rataplan, out of Hybla, by The Provost	started 8, won 4	won the Derby	2	Goodfellow	Whitewell, Clitheroe	R. Heseltine	30 gs.
Kildonan	bay	9	by Newminster, out of Shamrock, by Y. Priam	started 15, won 6	won Sales Stks., Newmkt.	untried.	—	Killeen, Phillipstown	—	5 gs., h. b. 2 gs.
King Brian	bay	13	by Crozier, dam by Ismael, out of Mignonette.	started 6	—	1	Royal Prince	Harewood, Leeds	W. Gadsby	10 gs., h. b. 3 gs.
King John	bay	6	by Kingston, out of Dinah, by Clarion.	started twice	—	untried.	—	Middle Park, Eltham	Mr. Blenkiron	20 gs.
King of the Forest	bay	13	by Orlando, out of Forest Flower, by Glaucus	started 61, won 20	won(h) Newmarket	untried.	—	Newmarket	Messrs. Barrow	10 gs.
King of Trumps	chesnut	18	by Velocipede, out of Mrs. Gill, by Viator	started 47, won 15	won the Port	34	Doefoot	Root, Clithero	R. Hesseltine	20 gs.
King Tom	bay	16	by Harkaway, out of Pocahontas, by Glencoe	started 6 won 3	ran second for Derby	75	Tormentor	Mentmore, Bucks	C. Markham	Full.
Knight of Avenel	chesnut	20	by The Doctor, out of Blue Bonnet, by Touchstone	started 6, won 4	won the Port	24	Pitman	Lady Kirk, Berwickshire	C. Billow	5 sov., h.b. 2½ sov.
Knight of Khars	bay	12	by Nutwith, out of Pocahontas, by Glencoe	started 10, won 2	won Whitley Stakes	25	Mother of Pearl	Stanton, Shifnal	Mr. Eyke	15 gs.

Knight of St. Patrick	bay	9	by the Knight of St. George, out of Pocahontas, by Glencoe	started 22, won 4	won the Column	8	Hebe	Burghley, Stamford ..	——	25 gs.
Kt. of the Thistle	chesnut	9	by The Knight of St. George, out of Ava, by Lanercost	started 5, won 2	won Wothorpe Biennial	untried.	——	Burghley, Stamford....	——	10 gs.
Knowsley	bay	8	by Stockwell, dam by Orlando	started 7, recd. ft.	ran third for 2,000 gs...	untried.	——	Doncaster	Mr. Cunningham	30 sovs.
Lambton	bay	17	by The Cure, out of Elphine, by Emilius......	started 26, won 10½	won York County Plate..	40	East Lynne	Low-street, Bedale	Mr. C. Ashton ..	20 gs.
Laughing Stock	bay ..	8	by Stockwell, out of Gaiety, by Touchstone...	started 10, won 4	won 300, Newmarket....	untried.	——	Kirklington, Carlisle .	Messrs. Moffat ..	7 gs.
Le Marechal....	bay	7	by Monarque, out of Lady Lift, by Sir Hercules	started 39, won 9	won £365 at York......	untried.	——	Knckhill, Ecclfchn, N.B.	R. Menzies	10 gs.
Lifeboat	brown ..	12	by Sir Hercules, out of Yard Arm, by Sheet Anchor	started 39, won 15	won Metropolitan Stakes	5	Life Guardsman	Bushbury, Wolverhampton	J. Daley	20 gs.
Little Hastings..	bay	14	by The Little Known, out of Flora Hastings, by The Libel	never appeared ..	——	untried.	——	Whitwell near Clitheroe	R. Heseltine	10 gs., h. b. 5 gs.
Loiterer	chesnut	10	by Stockwell, out of Ennui, by Bay Middleton	started 30, won 5	won mtch £1000, Nwmrkt	untried.	——	Croft Std Frm, Drlngtn	Mr. Winteringhm	12 gs.
Lord Clifden....	bay	7	by Newminster, out of The Slave, by Melbourne	started 12, won 7	won the St. Leger	untried.	——	Moorlands, Skelton, Yrk.	Mr. Thompson..	Full.
Lord of the Isles	bay	15	by Touchstone, out of Fair Helen, by Pantaloon	started 10, won 4	won 2,000 gs. Stakes ...	20	Dundee	Russley, Hungerford ..	J. Waugh	20 gs.
Lovett..........	black ..	11	by The Confessor, out of Julia, by Jerry......	started 17, won 3	won Oxford Stakes	untried.	——	Orlingbury, Wellingbro'	Mr. Manning ..	6 gs., h. b. 3 gs.
Lucky Star	black ..	6	by Mountain Deer, out of Dawn-of-Day, by Tearaway	started 18, won 5	won £295 (h) at Chelmsford	——	——	Furze House, Kildare..	——	5 gs., h. b. 2 gs.
Lundyfoot	bay	14	by Sweetmeat, out of Mulligatawny, by Economist	started 4........	——	——	——	Laggan Hall Stables ..	——	5 gs., h. b. 2 gs.
Mainstay	bay	7	by Ivan, out of Coquette, by Napier	started 3, won 1	won £225 at Curragh ..	untried.	——	Brownstown, Curragh..	——	5 gs.
Mainstone	bay	10	by King Tom, out of Blister, by Bay Middleton	started 10, won 2	won £360 at Stockbridge	untried.	——	Belhus, Romford......	Mr. Church	10 gs., h. b. 2½ gs.
Marquis, The ..	bay	8	by Stockwell, out of Cinizelli, by Touchstone	started 8, won 7	won the St. Leger......	untried.	——	Dringhouses, York....	Mr. J. Pearson..	20 gs.
Marquis, The ..	chesnut	19	by Birdcatcher, out of Ellen, by Birdcatcher, or Apollo	started 36, won 13	won the Angleseas......	4	Princess Royal..	Leggan Hall, Ireland	——	5 gs., h. b. 3 gs.
Marsyas........	chesnut	16	by Orlando, out of Malibran, by Whisker	started 7, won 3	won July Stakes	22	Eltham	Middle Park, Eltham..	Mr. Blenkiron ..	50 gs.
Master Richard .	chesnut	6	by Teddington, out of Energy, by Weatherbit.	started 33, won 8	won in all £3,000......	untried.	——	Littleton, Thurles, Ireld.	Mr. Betagh	7 gs. Full.
M. D............	brown ..	13	by The Cure, out of Theano, by Waverley	started 11, won 3	won the Nursery.......	1	Lord Conyngham	Mountainstown, Meath	——	3 sovs.
Mentmore	bay	12	by Melbourne, out of Emerald, by Defence....	started 34, won 11	won the Prendergast ..	untried.	——	Hampton Court	Mr. Ransom ...	10 gs.
Mogador	bay	6	by King Tom out of Moonshine, by Orlando ..	started 13, won 3	won £575 at Newmarket	untried.	——	Watr Tower Frm, Rgby	Messrs. Walker..	5 gs., h. b. 2½ gs.
Morocco	bay	8	by King Tom, out of Moonshine, by Orlando	started 11, won 1	won a hurdle race at Worcester	untried.	——	North Grimston, Malton	J. Harrison	5 gs., h. b. 2 gs.
Motley	bay	16	by Touchstone, dam by Lanercost............	started 24, won 5	won £60 at York	1	Huntsman	Burgh-by-Sands, Carlisl	Mr. J. Casson...	5 gs., h. b. 3 gs.
Mouravieff......	chesnut	11	by Pyrrhus the First, out of Wiasma, by Hetman Platoff	started 24, won 10	won Ascot Stakes	untried.	——	Newbury, Berks	Mssrs. Bland and Field	10 gs., h. b. 3 gs.
Narbonne	black ..	6	by Chevalier d'Industrie, out of Oakleaf, by Touchstone	started 7, won 1	won £50 (h) Lewes	untried.	——	Enfield, Middlesex....	Mr. H. Goodchild	10 gs., h. b. 5 gs.
Neophyte	bay	11	by Newminster, out of The Jewess, by Jacques	started 26, won 9	won £130 (h) Newmrkt.	untried.	——	Bedford Lodge, Newmkt	Mr. Dawson	gratis.
Neptunus.......	brown ..	8	by Weatherbit, out of Athena Pallas, by Birdcatcher	started 17, won 5	won Convivial Stks. York	untried.	——	Fairfield, York........	Mr. Jackson....	10 gs., h. b. 5 gs.
Neville	bay	16	by Napier, out of Sally Snobs, by Sandbeck...	started 16, won 7	won Gt. Northern Hand.	18	Honest John ...	Swalcliffe, Banbury ..	Mr. Gulliver....	16 gs.
Newcastle	chesnut	11	by Newminster, out of Mary Aislabie, by Malcolm	started 52, won 16	won Doncaster Cup ...	5	Valeria	Park Paddocks, Newmarket	Mr. F. Dawson..	10 gs., h. b. 5 gs.
Newminster	bay	19	by Touchstone, out of Beeswing, by Dr. Syntax.	started 10, won 2	won St. Leger	162	Lord Clifden....	Rawcliffe, York	Mess. Weatherby	Full.
North Lincoln ..	bay	11	by Pylades, out of Cherokee, by Redshank	started 31, won 17	won the Criterion	9	Maid Marian....	Mentmore, Bucks	C. Markham	20 gs.
Norwood	chesnut	6	by Orlando, out of Ayacanora, by I. Birdcatcher	never appeared ..	——	——	——	Beverley..............	Mr. C. Reynard.	5 gs.
Nottingham	bay	8	by Kingston, out of Athol Brose, by Orlando...	started 4	third for £2,000........	untried.	——	Owmby Paddocks, Brigg	Mr. J. Ashton ..	10 sovs.
Nutbourne......	chesnut	10	by Nabob, out of The Princess, by Merry Monarch	started 3, won 2	won the Findon........	3	Zenobia	Nutbourne, Emsworth	Mr. Wyatt......	20 gs.
Old Calabar....	bay	8	by King Tom, out of The Hipped Mare, by Picaroon	started 7, won [illegible]	won the Criterion	untried.	——	Newmarket	Messrs. Barrow..	10 gs., h. b. 5 sovs.

STALLIONS FOR THE SEASON, 1867—(*Continued*).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out by.	Sire of	Standing at	Apply to	Price.
Old Fashion	brown ..	13	by Melbourne, out of Lady Shrewsbury, by Launcelot	started 38, won 8	won £120 at Newmarket	1	Jonathn Oldbuck	Sharavogue, Ireland ..	——	5 sovs., h. b. 2½ sovs.
Optimist........	chesnut	10	by Lexington, dam by Glencoe (bred in America)	started 25, won 9	won Ascot Stakes	untried.	——	Newmarket	Messrs. Barrow..	7 sovs., h. b. 3½ sovs.
Orest	bay	10	by Orestes, out of Lady Louisa, by Touchstone	never trained	——	4	Skipper	Alfreston, near Lewes..	Mr. W. King....	10 gs.
Oulston	bay . ..	15	by Melbourne, out of Alice Hawthorn, by Muley Moloch	started 11, won 7	won Queen's Vase......	9	Russley	Newmarket	Messrs. Barrow..	12 gs.
Oxford	chesnut	10	by Irish Birdcatcher, out of Honeydew, by Plenipotentiary	started 9, won 2	won £220 at York	6	Student	Yardly, Birmingham ..	J. Pryke	30 gs.
Parmesan	brown ..	10	by Sweetmeat, out of Gruyère, by Verulam ..	started 28, won 10	won Great Metropolitan	4	Ravioli	Rufford Abbey, Ollerton	Mr. Coultas ...	Full.
Penarth	brown ..	11	by Verulam, out of The Bloomer, by Melbourne	started 3........	——	——	——	Blankney, Lincoln	Mr. Bartholomew	7 gs. h. b. 5 gs.
Peon	bay	6	by Alarm, out of Repentance, by Annandale..	started 16, won 5	won Ascot Derby Stakes	untried.	——	Sutton Place, Guildford	——	5 gs.
Peppermint	brown ..	18	by Sweetmeat, out of Pantalonade, by Pantaloon	started 5, won 2	won Bedford 2-yr-old St	9	Special	Hartford, Northwich ..	——	10 gs.
Plum Pudding ..	brown ..	10	by Sweetmeat, out of Fionualla, by Birdcatcher	started 8........	——	5	Ozone	Palmerstown near Naas	——	5 gs.
Prime Minister..	brown ..	19	by Melbourne, out of Pantalonade, by Pantaloon	started 31, won 8	won the Port..........	40	Mr. Pitt........	Highfield, St. Albans..	Mr. G. Mather ..	25 gs.
Prince Plausible	bay	9	by King Tom, out of Longitude, by Inheritor	started 30, won 5	won Chesterfield Cup ..	untried.	——	Willesden Pdks., Kilbrn.	Mr. C. Phillips..	12 gs., h. b. 6 gs.
Rapid Rhone....	roan ..	7	by Young Melbourne, dam by Lanercost......	started 21, won 9	ran third for The Derby	untried.	——	Palmrstwn, Naas, Irlnd	——	5 gs.
Rapparee	brown ..	9	by Rataplan, out of Lady Alicia, by Melbourne	started 20, won 5	won Ascot Stakes	2	Leases..........	Harleston, Northampton	Mr. Wilson	10 gs., h. b. 5 gs.
Rataplan	chesnut	17	by The Baron, out of Pocahontas, by Glencoe	started 71, won 42	won 21 Royal Plates ...	52	Kettledrum	Tickhill Castle Farm ..	W. Hornshaw ..	30 gs.
Rattle..........	chesnut	17	by The Fallow Buck, out of The Hamble, by Camel	started 7........	——	15	Longdown	Palmerstown, near Naas	——	10 gs.
Rattlebone	grey ..	10	by Cruiser, out of Wicket by Stumps	started 23, won 6	won £450 at Stockbridge	2	Chicken Hazard	Newmarket	Messrs. Barrow..	5 gs.
Redoubt........	bay	5	by Artillery, dam by Blackfoot..............	started 5, won 2	won £105 (h) at Lewes	untried.	——	Monkton, Swindon....	Mr. H. Brown ..	7 gs., h. b. 3 gs.
Robin	bay ...	4	by North Lincoln, out of Blooming Heather, by Melbourne	started 11, won 2	won £205 (h) at Ascot..	untried.	——	Mentmore, Bucks	Mr. Markham ..	5 gs.
Rochester	black ..	20	by Chatham, out of Margravine, by Little John	started 17, won 5	won £275 at Newmarket	12	Cowley	Water Tower, Rugby ..	Walker & Watson	5 gs., h. b. 2½ gs.
Roebuck	brown ..	10	by Mountain Deer, out of Marchioness d'Eu, by Magpie	started 2........	——	untried.	——	Rutland, Limerick	——	5 gs., 3 gs.
Roman Bee	brown ..	7	by Artillery or Irish Birdcatcher, out of Queen Bee, by Harkaway	started 7, won 3	won £430 at Curragh ..	untried.	——	Curragh, Kildare......	——	5 g., 2 gs.
Romulus	brown ..	9	by The Flying Dutchman, out of Priestess....	started 1, won 1	won LongleatStks, Slsbry	——	——	Alford, near Chester ...	Mr. T. Parker ..	10 gs., h. b. 5 gs.
Ruby	bay	16	by Bay Middleton, out of Crown Jewel, by Dulcimer or Coronation	started 9, won 1	won Althorp Park S. ..	6	Rubini	High Wycombe.......	Mr. T. Robinson	10 gs., h. b. 3 gs.
Saunterer	black ..	13	by Irish Birdcatcher, out of Ennui, by Bay Middleton	started 54, won 26	won Goodwood Cup	17	Zambesi	Middle Park, Eltham..	Mr. Blenkiron ..	50 gs.
Scandal	brown ..	12	by The Cure, out of Prudery, by Lanercost ..	never appeared .	——	2	Sidewind	Fairfield, near York ...	Mr. Jackson	5 gs., h. b. 2½ gs.
Scottish Chief...	bay	6	by Lord of the Isles, out of Miss Ann, by The Little Known	started 7, won 4	won Ascot Cup	untried.	——	East Acton, Middlesex	Mr. Donald	30 gs.
Sharper, The....	brown ..	4	by Ellington, out of Overreach	started 9, won 4	won £26 at Newmarket	——	——	Leatherhead	Mr. Constable ..	5 gs., h. b. 3 gs.
Simple Simon ..	brown ..	10	by Woodpigeon, out of Nicotine, by Ion......	started 16, won 4	won Northampton Stakes	2	Simple Maid....	Harpenden, Herts	Mr. R. Fuller...	10 gs., h. b. 5 gs.
Sir John Barleycorn	brown ..	18	by The Baron or Ismael, out of Loveslip, by Camel	started 4........	2nd Prize at Royal Show	3	Baron of Avon..	Skermett, Henley-on-Thames	Mr. T. Hussey ..	6 gs., h. b. 3 gs.
Skeffington	bay	6	by Teddington, out of Juanita Perez, by Melbourne	started 6 won 0	2nd for Chesterfield Cup	——	——	Knighton, Radnor ...	Mr. Griffiths	10 gs., h. b. 3 gs.
Skirmisher......	bay	13	by Voltigeur, dam by Gardham..............	started 23, won 8	won Ascot Cup	16	Privateer	Rawcliffe, York	Mr. Martin	20 gs.

Solon	bay	6	by West Australian, dam by Birdcatcher	started 17, won 9	won £380 at Epsom	untried.	——	The Curragh	——	5 sovs.
St. Albans	chesnut	10	by Stockwell, out of Bribery, by The Libel	started 8 won 5	won St. Leger	15	The Primate	Bushey Paddocks, Hampton Court	Mr. Ransom	50 gs.
Stampedo	brown	10	by Alarm, out of Repentance, by Annandale	started 10, won 2	won Northamptonshire S.		——	Newmarket	Messrs. Barrow	10 gs.
Stapleton	brown	12	by Staplefield, out of Hoyden, by Gilbert Gurney	started 31, won 3	won Longleat Handicap	——	——	Chichester	Mr. Hubin	5 gs., h. b. 3 gs.
Stockwell	chesnut	18	by The Baron, out of Pocahontas, by Glencoe.	started 21, won 12	won St. Leger	139	Blair Athol	Hooton, Chester	John Griffiths	Full.
Storm	bay	19	by Touchstone, out of Ghuznee, by Pantaloon	started 2, won 1	won £460 at Doncaster	12	Gauntlet	Ladykirk, Berwick	C. Belton	5 sovs., h.b. 2½ sovs.
Suburban	bay	10	by Stockwell, out of Jane, by Verulam	started 50, won 10	won the Gt. Wrwcks. H.	untried.	——	Willesden Paddocks	Mr. Phillips	15 gs., h. b. 7½ gs.
Surplice	brown	22	by Touchstone, out of Crucifix, by Priam	started 16, won 9	won the Derby	56	Lady Clifden	Hasketon, Woodbridge	Capt. Barlow	15 gs.
Sussex Stag	bay	5	by Findon, dam by Fallow Buck	never appeared	——	untried.	——	Kilmallock, Ireland	G. A. Harriss	4 sovs.
Thormanby	chesnut	10	by Melbourne or Windhound, out of Alice Hawthorn, by Muley Moloch	started 24, won 14	won the Derby	7	Plaudit	Cawston, near Rugby	W. Hemming	Full.
Thunderbolt	chesnut	10	by Stockwell, out of Cordelia, by Red Deer	started 26, won 13	won the Stamford Plate	2	Lady Hester	Sutton Place, Guildford	——	25 gs.
Tim Whiffler	brown	8	by Van Galen, out of Sibyl, by Ugly Buck	started 26, won 11	The Goodwood Cup	untried.	——	Croome, Worcester	W. Hadley	18 gs.
Tom Bowline	bay	10	by The Flying Dutchman, out of Miss Bowe, by Catton	started 13, won 4	won a Sweepstakes £500, Newmarket	3	Jura	Doncaster	Mr. Cunningham	15 sovs.
Tom Tit	bay	4	by King Tom, out of Sprightly, by Gladiator	started 2	——	untried.	——	Conington-lane, Peterbro	J. Dring	5 gs., h. b. 3 gs.
Touchwood	bay	11	by Touchstone, out of Bonnie Bee, by Galanthus	never appeared	——	2	Rhoda	Highfield, St. Albans	Jas. Fielding	5 gs., h. b. 3 gs.
Toxophilite	bay	12	by Longbow, out of Legerdemain, by Pantaloon	started 18, won 11	Second for the Derby	9	White Duck	Doncaster,	Mr. Cunningham	20 sovs.
Trumpeter	chesnut	11	by Orlando, out of Cavatina, by Redshank	started 4, won 2	won Newmarket Biennial	19	Kœnig	Danebury, Stockbridge	J. Day	20 gs.
Umpire	chesnut	10	by Le Comte, out of Alice Carneal, by Imp Sarpedon	started 40, won 13	won £585 (h) Goodwood	untried.	——	Croome, Worcester	W. Hadley	12 gs., h. b. 8 gs.
Underhand	bay	13	by The Cure, out of Contraction, by Emilius	started 45, won 12	won Northamp. Plate (3)	2	Bracken	Rawcliffe, York	Mr. Martin	10 gs.
Vengeance	bay	15	by Chanticleer, dam by The Saddler	started 21, won 7	won Cesarewitch	9	Sidmonton	Hurstbourne, Whtchrch.	R. Milton	12 gs.
Victor	brown	8	by Vindex, dam by Scroggins—Miss Eliza	started 6, won 1	won Hunt Cup at Ascot	untried.	——	Kilmallock, Limerick	——	4 sovs., 2 sovs.
Victorious	bay	8	by Newminster, dam by Jeremy Diddler	started 10, won 6	won Nursery Stakes	untried.	——	Rawcliffe, York	Mr. Martin	10 gs.
Voltigeur	brown	20	by Voltaire, out of Martha Lynn, by Mulatto	started 11, won 5	won the Derby	106	Buckstone	Middlethorpe, York	Mr. Smallwood	20 sovs.
Von Ghlen	bay	6	by Voltigeur, out of Heroine, by Neasham	never appeared	——	——	——	Addington, Croydon	Mr. Walker	3 gs.
Wallace	chesnut	10	by Malcolm, out of Manœuvre, by Rector	started 25, won 4	won the Goodwood Stakes	untried.	——	Willesden Pdks, Middx.	Mr. Phillips	20 gs.
Walloon	brown	9	by The Flying Dutchman, out of Nina, by Cotherstone	started 60, won 15	won Champagne Stakes	untried.	——	Ruabon, North Wales	Mr. G. Bonner	7 gs., h. b. 3 gs.
Wantage	chesnut	15	by Collingwood, out of Flash of Lightning, by Velocipede	started 26, won 11	won £200 (h) at Chester	1	Comberton	Pershore	W. Mason	10 gs., h. b. 3 gs.
Warlock	roan	14	by Birdcatcher, out of Elphine, by Emilius	started 19, won 6	won St. Leger	17	Puritan	Wentworth, Rotherham	Mr. Oates	15 sovs. Full.
Welcome	bay	8	by Fazzoletto, out of Auld Acquaintance, by Irish Birdcatcher	started 23, won 4	won Coffee-room Stakes, Newmarket	——	——	Kilfield, York	R. Gill	10 gs., h. b. 2½ gs.
Welland	chesnut	8	by Augur, out of Sackbut, by Dulcimer	started 39, won 10	won Portland Plate	untried.	——	Carnagh, Ross, Ireland	——	4 sovs., h. b. 2 sovs.
Wild Dayrell	brown	15	by Ion, out of Ellen Middleton, by Bay Middleton	started 4, won 3	won the Derby	59	Robin Hood	Chilton, Hungerford	Mr. Hodgson	40 gs.
Wilton Beau, The	bay	8	by Red Hart, out of Wilton Arrow, by Charles XII.	never appeared	——	untried.	——	Beau Parc, Ireland	——	4 sovs.
Wingrave	bay	8	by King Tom, out of Incurable, by The Cure	started 39, won 13	won Woodcote Stakes	untried.	——	Clumber, Worksop	Mr. W. Scott	12 gs., h.b. 5 gs.
Xurullo	bay	8	by Orlando, out of Vesuvienne, by Gladiator	started 35, won 7	won £100 at Newmarket	untried.	——	Thame, Oxon	Mr. Clifford	6 gs., 3 gs.
Yorkminster	brown	8	by Newminster, out of The Bee, by Gladiator	started 14, won 5	won £105 at Heath	untried.	——	Callenberg, Inniskien	——	1½ sovs.
Y. Dutchman (late Gen. Havelock)	—	10	by The Flying Dutchman, out of Wish, by Touchstone	never appeared	——	3	Honesty	Catterick	Mr. Bennison	10 gs.
Young Melbourne	bay	12	by Melbourne, out of Clarissa, by Pantaloon	started 1	——	14	General Peel	Doncaster	Messrs. Wetherby	50 sovs.
Zouave	chesnut	13	by Bantam, out of Coquette, by Napier	started 16, won 6	won Marble Hill Stakes	untried.	——	Old Town, Ireland	——	2 sovs.

The Groom's Fee, if not included, varies from a Guinea to Half-a-Crown.

DAINTY FEEDERS.

No animal working so hard as the horse is usually compelled to do can long perform his duties effectively if he does not feed well. To support the vital powers in their vigour, frequent supplies of suitable food must at short intervals be eaten and duly assimilated. All practical horsemen are thoroughly cognisant of the fact that if a horse is to stand work he must grub well. After his day's labour in the cart or carriage, as a hack or as a hunter, he must retain his appetite, and be able to clear up his supper. Very gratifying is it to the horsemaster's ear to hear his willing steed after a long and weary journey devouring his corn with avidity. The sound appetite which waits on good digestion truly tells that the ready servant has not been overtasked, and that he is blessed with hardiness and endurance. But unsatisfactory is it indeed when the horse, after ordinary work, is crestfallen, dull, and exhausted, when he daintily picks at instead of readily eating his corn, when he becomes thirsty and feverish. Such a state of matters indicates something amiss; sometimes it points to want of condition, to a cold or some impending ailment; but when of tolerably regular occurrence in a well-fed and properly managed horse, it tells of a weakly and unthrifty constitution. Such a defect is most notable amongst narrow-made weedy horses light in their girth, and disfigured with flat ribs, long backs, and open loins; it is common amongst indifferently bred animals; is most frequent amongst horses of light and faulty colours, such as light dirty greys, light chesnuts, or light bays; it is apt to distinguish horses bred in wet marshy districts rather than the tougher and hardier race reared on dry and upland pastures.

What is to be done with the horse that refuses to eat after severe or long-continued exertion, as when he comes in way-worn and weary from a toilsome journey, after the violent effort of a well-contested race, or after a sharp spurt over a heavy country in the wet and spongy state in which it was before the present frost set in? He should have his mouth sponged out; a few mouthfuls of water or of spirits and water given; his body washed rapidly over with tepid water, if he has been accustomed to such dressing; his legs rubbed down and comfortably bandaged; a soft bed provided; and a gallon or two of well-boiled gruel offered to him. If he refuses to drink the gruel, he had better have it given as a drench, and along with it an ounce each of powdered gentian and sulphuric ether. If the appetite does not speedily return, and the horse continues dejected, this drink may be repeated every hour. In the absence of the ether and gentian a couple of glasses of whisky and half-an-ounce of ginger may be given in a quart of warm water or gruel. Whilst corn is still disregarded, a handful of nice hay will sometimes be eaten; whilst further to tempt the capricious appetite, the corn may be scalded, or a sliced carrot, a linseed mash, a little malt, or some soaked stale bread offered. Stale bread moistened either with beer or water will often be eaten when the horse cares for nothing else, and is invaluable in cases of influenza, gastric fever, and other cases where the appetite for ordinary food is lost.

Horses occasionally do not eat so well as they should do owing to their being kept short of water—a practice to which some grooms are partial, supposing that the water swells out the horse and interferes with his condition. This is obviously a fallacy. Except for a few hours before any great exertion at a fast pace, horses should be allowed as much water as they care to drink, and if they have it always before them, or have the offer of it four or five times daily, they will not drink more than is good for them, and will enjoy and digest their food much better than if restricted to a niggardly supply of this wholesome necessary.

Horses often eat insufficiently, and hence thrive badly, owing to their food being of indifferent quality. Hay that has been wetted and weathered, that has lain long in a loft, that has been trodden on, or dirtied by fowls, is never palateable even to the least particular of horses. Kilndried musty oats are likewise bad horse-food. When the fodder is indifferent, it requires a considerable amount of tact and trouble to have it consumed without waste. Only a small quantity should be given at a time. A large proportion of the hay should be cut, and the oats bruised; whilst any unpleasant flavour may be covered by giving the chaff or corn moistened with a little linseed-tea or treacle-water. Many dainty-feeding horses, most old-stagers, and all faulty in their wind, thrive best when they receive the bulk of their food damped. As in other animals, an occasional diversity in their dietary will often greatly improve the appetite.

Grooms and carters sometimes adopt very questionable expedients for stimulating the appetite of the animals under their charge, and are extremely partial to the giving of powders and balls of aromatics, sulphur, nitre, antimony, and even arsenic. But physic of all kinds, even under the attractive titles of "condiments," "restorers," or "condition medicines," should be strictly forbidden, unless when ordered by the master or the veterinary surgeon. Even the simplest medicaments are apt, in ignorant hands, to be abused: they cannot be employed persistently without doing harm—they can never take the place of rational feeding. Good grooming and properly-regulated exercise or work are the three grand essentials for maintaining a horse in health and condition.

When a horse in fair condition and at ordinary work does not feed well, it will be desirable to ascertain if he is thirsty and feverish, if he runs at nose, or has any other symptoms of cold, and if his teeth are sound and regular. Young horses, when first put on hard feeding and full work, are apt to get out of sorts. They have indigestion; their coat is dry and rough; they perspire easily, and are faint; they drink, but do not eat much; their urine is high-coloured; their dung is rather hard, and covered with mucus; often they stand with their mouth open and upper lip everted, and greedily lick at the walls of the stable, or devour earth or dirt. This state of matters is best combatted by a moderate dose of physic, by two or three draughts of Epsom salts and nitre, by a few days' restriction in the quantity of corn, and by a few mashes of bran or linseed.

The attacks of cold, which, in hard-worked horses much exposed to vicissitudes of weather, are so apt to impair the appetite, are most rationally treated by a few days' rest, by steaming of the head, embrocations to the throat, a mash diet, a little saline mixture, and half a dose of physic.

Some young, and many old, horses feed badly, owing to their teeth or gums being out of order. In three or four-year-old animals, mastication is often a difficult and painful process, from the gums and palate being congested and swollen, owing to the eruption of the permanent teeth. This constitutes what, in stable-phrase, is known as lampas. The tender turgid gums and palate may be relieved by lancing: the use of the hot iron must not, however, be permitted; and soft and cooked food should for some weeks be liberally supplied. Occasionally, the grinders are so rough and uneven as to bruise and even penetrate the opposing gums. The poor animal has no diminution of appetite. He takes up his food readily enough, chews it partially, but then drops the imperfectly chewed morsel from the side of his mouth. This quidding or cudding of the food, which is common amongst old horses constantly kept on hard provender, is an almost indubitable evidence of faulty teeth, and is usually remedied by rasping down the asperities of the uneven grinders. In a few cases, however, quidding results from sore throat, paralysis of the muscles of the pharynx, and occasionally merely from force of habit.—*North British Agriculturist.*

CALENDAR OF AGRICULTURE.

The sowing of oats must now be finished, and barley sown at the rate of 2 or 2½ bushels an acre on the fresh furrow of the light or turnip lands, and cover the seed with three longitudinal tines of the common harrows. On the stiffer turnip soils the surface will be stale to receive the seed, being ploughed in February or early in March, in order to obtain by the action of atmospheric changes the finely-comminuted tilth of soil, which is so very essential to the growth of barley and of grass seeds. Roll the newly-sown barley across the ploughing with a heavy weight. Sow the grass seeds, well mixed by hand on the flat surface with the broadcast machine, which much exceeds the hand-sowing in the level distribution of the seeds, and low to the ground from the force of the wind. Finish the work by a tine of the light harrows. The winter surface of wheat lands, if rough and cloddy, are harrowed by the common harrows; the seeds sown by the machine, rolled with a heavy weight and covered by the light harrows.

Sow lucerne on deep lands of good quality, and enriched by ample manuring, well-cleaned and deeply wrought. Allow 20 lbs. of seed to an acre; cover by harrowing; roll heavily; and harrow with the light harrows. If the surface be cloddy, roll again with a lighter weight, and harrow again to prevent the pasting of the surface. Sow flax on good lands, rich with manure and cleared from weeds and stones. Harrow and roll lightly, to keep the surface open.

Sow vetches for the second succeeding crop for summer in soiling animals in the yards, as milch cows and work horses, on stubble lands and on grass lays along with oats; also for sheep feed on the ground, or wheat lands after stubble of oats, to prepare for a crop of wheat. This arrangement gives a good crop of wheat, and defers the too frequent fallowing of the very obdurate clays of the poor marine quality. Top-dress young grains and grasses, and shut-up the hay grounds and natural meadows.

The land of the stiffer loams being got ready by ploughing, harrowing, and rolling, and all stones and weeds removed by hand-picking, open drills by a "bout" of the common plough, 30 inches in width, and deeply-furrowed in order to cover the dung and sets with a thick alluvium of pulverized soil. Spread along the hollows of the drills an ample allowance of half-rotted farm-yard dung, on which place the potato sets, "fresh cut," at the distance of 9 inches apart; split and reverse the drills over the dung by a "bout" of the common plough, and roll the drills with a weight of about 6 cwt. The potato sets must be strong and fleshy: have two eyes in each set, and able to nourish the germination till the root finds the food of the plant. The dung for potatoes must be very moist, and freshly putrescent, and used in a large quantity.

Plant beet root in the end of the month, on drills of 28 inches in width, on lands of stiff clayey loams, well wrought, and cleaned by ploughing, harrowing, and rolling, and hand-picking of weeds and stones. Give a large allowance of farm-yard dung in a state of incipient fermentation, and in a condition, Sow the seeds on the drills by hand-dibble or machine, and roll lightly.

Lime is most beneficially applied to the land with the cultivation of beet and potatoes. The cinders hot from the kiln are laid in a narrow heap along the headland of the field, turned over some days before being used, dissolved by water into powder, but not into paste, carried by one-horse carts, and spread evenly over the surface of the ground by hand shovels, and immediately harrowed, to prevent any blowing by the wind. The opening of the drills is then done, and the reversing of the drills follows, mixing the soil with the lime in a hot quicksilver pulverulence, which enters into every opening, however small, in the earthy alluvium. The subsequent scufflings and hoeings of the crop all tend most advantageously to the minute mixing of the bodies in contact. The dissolution of the cinders placed in or above the ground requires a time to effect the purpose, and it cannot be spared in the haste of planting the crops, and the mode now mentioned is of immediate application, and most beneficial in the results. The chief benefit from lime arises from the incinerated body evoking caloric, and raising the temperature of the ground by its warmth, and the very hottest pulverulent condition is most likely to produce that effect.

Horse and hand hoe all drilled crops, as wheat, beans, peas, and lucerne if in drills, and carrots if ready, during the month.

Paring and burning of moorish foggy surfaces will now be done: if pared in March the better. Place the turfs into small heaps, and burn moderately into a black torrefied mass, to contain the most carbonaceous matter. Calcination of the soil is to be avoided.

Fold the sheep, ewes and lambs, on early vetches, winter barley, rye, and watered meadows; or cut the food and place it in racks. Confine the animals over night in a fold, allowing two square yards to each animal, and two nights in one place. Cutting the food may be the most economical method. All bare grounds and inferior grass lands are much improved by folding of sheep on the surface.

Lambing will be over with this month. Remove the stronger lambs to the pasture fields, and give the ewes sliced turnips, cabbages, oats, and bruised cake, placed in troughs with a portion of salt.

The long days will now require more food for all animals — cows with food steamed in roots and chaff; bullocks with swedes and beet; and young animals with portions of the same. Spare no trouble or expense with young animals. Give the oldest calves some of the earliest green food, to teach them to live without milk; use also bruised cake, bean and barley meals, and linseed jellies, with chalk and rock salt to lick.

Fat and aged cattle must now be all removed from the winter stalls. Use oilcake in finishing off the fat animals. The most backward in condition must go to grass, and there fattened.

The season of curing bacon being over, the remaining pigs on hand must go on for summer stores, and come in for early winter fattening. The earliest lambs will now be fat for sale.

During wet weather carry all dung from the cattle-yards to the heaps in the fields, and litter the yards afresh for the summer soiling of cattle and horses.

Prepare by ploughing, harrowing, and rolling the fallows for green crops, beet and swedes, as foremost in this month and the next. Plough clay lands for wheat fallows, when opportunity happens in an advanced state of farm-work. Gather off the surface of grass lands to be cut for hay the stones that may obstruct the scythe, with one-horse carts and hand baskets, and lay in a corner to be broken for road metal, as heaps on a field ever leave unsightly marks.

CALENDAR OF GARDENING.

Kitchen Garden.

The kitchen garden will form the chief attention of the farmer, to raise an early, an abundant, and a constant supply of vegetables by a cultivation of land in the superlative degree. For this purpose the land must be deeply dug in two spits of 8 inches each, amply manured for each root crop with cattle-yard dung, with a sprinkling of Peruvian guano on each trench of ground. When no dung is applied to stalky crops, much benefit will be derived from small cinders of lime placed in spits of soil, of which the dissolution will evolve caloric to warm the ground and raise the temperature. The damp exhalations from the lime will convey a very active impetus to the growth of plants.

Dung must be collected and prepared for the special use, in a heap or in a brick-cemented pit, with short and chaffy cattle-yard dung, leaves, and green herbs, droppings of animals, constantly wetted with suds and dirty water of all kinds. Deep digging and ample manuring will make any lands fertile: without it no success can be obtained. But lands so managed will reward the labour with luxuriant crops, and show by experience what vegetables ought to be.

Sow peas—the Scimitar and Prussian, as profuse bearers—and broad beans, both as succession, twice at any period of the month, of any most approved sorts. About the 21st, if the ground be warm and dry, plant the first crop of kidney beans. The early leaves are very often destroyed by slugs and shell-snails. A good deal of disappointment is saved by sowing three in a pot, either in March or early in April, or in boxes under glass, to be transplanted, when the true leaves become strong, into shallow trenches of pretty rich soil, a few inches apart: in the latter case sow early in the former—not before the 15th. The plants thrive remarkably well, and require watering in dry weather. An ounce of pure and rich guano, stirred up in two gallons of water, and given to the extent of half-a-pint to each three plants, seems to act very nicely on the health and verdure of transplanted beans: the application confers on the soil small and extremely diluted portions of phosphate of ammonia and of lime, urate of ammonia, common salt, sulphate of potassa, and some valuable animal matter. True guano, carefully applied, is a capital enricher of old and poor stable-yard dung, horses' droppings, and leafy composts.

Sow lettuce, radish, corn, and small salading twice or thrice; "borecole," including Scotch kale and Brussels' sprouts; broccoli for winter and spring—the early Grange's, white, or Siberian hardy; Miller's late dwarf, and the "protected." Cabbage and Savoy will supply successions, if sown early and late in the month. Sow spinach repeatodly. Silver onions very thickly for drawing when young. Onions for bulbing, and leeks, if not already sown; carrot, parsnip, and red beet—all in the first days.

Potatoes.—The main crop and the second early should be soon planted. All seed tubers should be immature, or not fully ripened, if planted whole: success is more certain, though two-eyed tubers bear well. Plant artichoke suckers, if well-rooted, in prepared beds, choosing showery weather.

Transplant lettuces, but expect them to run; cabbage, cauliflower, celery, and celeriac, from the seed beds, upon plots of very rich soil with much-reduced manure, on which the plants may become stocky.

Dress all the beds with hoe and rake, earth-up and stick peas, and attend to neat order.

Sow celery—hardy red and Seymour's white—on gently-warm leaf-beds; also nasturtiums and aromatic herbs.

Asparagus will now be soon rising, and must be cut, so as to avoid injuring the crowns, either by too rigid excision or by uselessly wounding the adjoining shoots. In order to procure a real good grass, six inches of which shall be high in colour, full in flavour, and tender in its whole length, a deep and rich bed must be made, of which any repetition will be excused, on account of the great value of the vegetable. The land having been deeply dug and enriched with manure, and being settled, is to be divided by 15-inch wide alleys into so many beds, about three feet wide, as the ground will admit: the beds are raised some inches by the earth shovelled from the alleys. The surface being raked into much fineness, two drills are drawn about two inches deep, one foot from the edge on each side, and as much apart. The best asparagus seed is to be sown two or three inches apart along the drills, and immediately firmly covered with light earth. As the plants rise they are now and then thinned out to stand at first three inches apart, then six inches: guano-water, very weak, will promote growth and strength. Such seedlings, when thinned to one foot asunder, and properly managed, will produce plants strong and as durable as if two-year-old plants were purchased. Should that plan, however, be preferred, the fine earth must be raked off to the alleys four inches in level depth. The line then being stretched, the plants are to be placed by it, the root being opened spread flat, and extending every way; over which the earth is to be evenly spread and pressed carefully down, the crowns being retained upright in the centre: a good watering from the rose finishes the operation.

Sea-kale beds, being prepared much in the same way, are to be sown with sound seeds, by the line, "three seeds" in a small circle of six inches in diameter, two inches deep, and the circles two feet apart; the rows may be single, at four feet distances, or if double, two feet asunder to form a bed. The ground cannot be too turfy, or too clear of stones; and if manured to the extent of one-half of its own bulk, so much the better.

Fruit Garden.

Place mulch about and over the roots of fruit trees, and dust the leaves with sulphur to prevent mildew. Strawberry beds, or rows newly planted, must have liberal supplies of water, if dry weather sets in. Cucumbers should be thinned to a regular number of shoots, and stopped at a fruit, and not at the joint beyond it.

Flower Garden.

Attend to annuals in pots, to thin out the seedlings; plant herbaceous varieties; sow the annuals for summer as the main stock, and as a succession to those in March; propagate by slippings or rooted offsets the herbaceous tribes.

Weed, hoe, and rake, removing flower-stalks with scissors.

Sweep and roll the lawn, and mow the grass in damp showery weather; plant and renew box-edgings; and clean the gravel walks, rolling them after rain.

Guano in fine powder, one ounce to the gallon of soft-water, is a most useful stimulant to succulent plants of many kinds.

Change of situation is as essential to flowers as to garden crops, and the ground must also be renewed, changed, and timely enriched. In bedding out for flowers the soil is best entirely changed yearly, and the old earth removed to the compost ground to lie fallow for a time, or to be scattered over the shrubberies and flower quarters. The present ignorance of the chemical elements of ornamental plants in general must be contented to introduce fresh loam, decayed turf, cow-dung, leaf-mould, and turfy heath soil, according to the known habits of each tribe.

GANG LABOUR IN THE FENS.

London was perfectly startled by the revelations of an amateur casual, hardly believed the statements in the Blue Book about tramps, and will, we doubt, at heart suspect the gentlemen who have just reported on gang labour in Lincolnshire and the Eastern Counties of unconscious exaggeration. The evidence in this last case, however, is unusually complete—complete enough to demonstrate beyond all cavil the existence among us of many thousands of persons as uncivilised as the natives of newly-discovered islands. The reporters employed by the Home-office to inquire into the effects of the system of gang labour commonly employed in the Fen country, report, on testimony almost unanimous, facts which may be thus condensed: In the marshy districts of Lincolnshire, Huntingdon, and the Eastern Counties, some seven thousand children are employed, chiefly in weeding, on a system but little differing from prædial slavery. Idle labourers, or labourers of indifferent character, collect gangs of children of all ages from among the cottages, paying the parents so much a week for each, and hire their gangs out to neighbouring farmers. The children are marched in the morning to their work often six miles off, compelled to toil for ten hours under fears of oaths and blows, and then marched back in the dusk, tired to the point of utter exhaustion. Girls are employed as well as boys, all ages are welcome, and no attempt is made at any separation of the sexes. The gang-masters are very seldom decent persons, and find the trouble of exacting sufficient work quite as much as they can manage, and leave the children when the work is done to their own inclinations and devices. Wholly uneducated, accustomed to cottages where all ages and both sexes are huddled together like animals, compelled when in the fields to do everything in public, the children never acquire the most rudimentary sense of decency. It is not so much that they become immoral as that they do not know what morals are. They are beneath morals. They are never permitted to rise out of the stage of life in which obscenity seems amusing, chastity unnatural, delicacy a useless encumbrance. Forced into incessant companionship with the opposite sex, wearied with toil so severe that it kills the girls and hardens the boys into gipsies, with no external restraint, and no idea that restraint is useful, both sexes slide altogether out of civilisation—bathe together, sleep together huddled in barns to avoid the toil of walking home, and vie with each other in obscenity of phrase and gesture. So utterly degraded do they become, that even labourers inured to cottages with one room to each family, coarse of speech, and callous of feeling, are revolted by their behaviour, and refuse to allow their daughters to enter the fields, except when compelled by actual want. This drives the gang-masters back on a still more debased class—girls who have early lost their characters, women who never had any characters to lose, the most ruffianly or the least educated of the village lads, to whom, as several witnesses testify, the licence of the gangs is the real attraction. The evil therefore intensifies itself until it is proved on the testimony of dozens of clergymen, surgeons, and decent labourers, that the introduction of gang-labour in any village extinguishes morality. Or, to put it more accurately, it prevents a generation, which would, under any circumstances, be coarsely bred, from acquiring even that faint tincture of civilisation which secures, if not refinement, at least external decency—if not chastity, at least some regulation on the intercourse of the sexes. They become savages without that unconsciousness of law which in savages has been so often mistaken for innocence, with just so much consciousness as to feel delight in insulting all more decent than themselves. Persons by no means over-refined themselves declared to the Commissioners that the gangs were public nuisances, sources as well as centres of pollution, so bad that they made the public roads impassable; and even the farmers who benefit by the labour, admit and deplore the moral consequences of the system. Nevertheless, it has a tendency to extend. The gangs offer a supply of very cheap and very obedient labour; the cottagers in many villages are so wretchedly off that an addition of 6d. or 8d. a day to their wages is irresistibly attractive, and the tone of manners, if not of morals, is still in many districts wretchedly low. The clergymen who give evidence all report that the children employed in the gangs are worse than ordinary cottagers; but they almost all admit and lament the fashion in which they are brought up, and which renders civilisation almost impossible. Even mothers who gave evidence against the system say they yield to it for the sake of the money it brings, and the only defence is characteristic of a general lowness of moral tone. This is, that the viciousness of the gangs is not the result of gang-labour, but only a very patent exhibition of the universal coarseness and depravity of the agricultural poor. Then the system enables such landowners who own whole parishes to pull down most of their cottages, and thus relieve themselves in great measure of poor-rates, a device which has only become useless since the passing of Mr. Charles Villiers' Union Chargeability Act.—*The Economist.*

EMIGRATION.—WHERE TO GO?

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Having perused with interest the paper read by the Rev. E. Smythies on "Emigration: What to Do, and Where to Go," reported in your Journal of the 11th, and a later letter of Mr. Hall's on South African farming, together with your leader on the subject, I notice in the discussion at the Farmer's Club no one appeared to think of the advantages offered by the colonies of "Natal" and the "Orange Free State" for mixed and sheep farming. Having travelled through one, and resided for two years in the other, I am enabled to speak with confidence as to the valuable openings presented in both for young men of enterprise with small or large capital. There are hundreds of farmers having sons, for whose future they feel most anxious: the weekly agricultural journals in their advertising columns prove the numbers of well-trained, educated, and respectable young men, who cannot find proper outlets for their talents and energies. At Natal they would find a lovely climate, where life is truly enjoyable, the cold cheerless sloppy weather of England quite unknown. The temperature is never excessive, nor of such a description as to prevent field labour at any period; the summer is mild, and during that time the greater proportion of the annual rains fall, commencing in September and ending in March. From the Bay of D'Urban to the Drakensberg Mountains, 150 miles from the coast, following the roads to the interior, the scenery is most interesting: just beyond the town of D'Urban a hilly jungle rises, covered with evergreen bush and ornamental timber, flowering shrubs of beauty, and blooming creepers adorn the trees—enchanting to a lover of nature.

The soil is like the red sandy hills of Biggleswade, in Bedfordshire, so famous for carrots and other garden produce. When the bush is cleared, this land is found admirably suited for coffee, sugar, cotton, and other tropical products. Land of this kind, according to locality and situation, can be bought from £1 to £5 an acre. Passing from this point towards the capital, Pieter Maritzburg, fifty miles inland, the country appears undulating, and, near the coast, dotted here and there with clumps of trees like our old English parks. Grassy meadows, fringed with evergreen shrubbery along the watercourses that abound, give an aspect of beauty to the landscape. The mimosa bushes in some parts are scattered over the country like our whitethorn, and have a very similar appearance. From the hill beyond Maritzburg, 2,080 feet high, a most magnificent view is obtained—grass-covered valleys, flowing streams, wooded kloofs, and Caffir kraals (a sure sign of the land being fertile), along the road; valleys and hills covered with greensward are seen; there, high towering mountains of granite; here, fine flats on the rivers' banks, but idle and unpeopled. Whilst gazing on these solitudes, I have wished that my countrymen could be transported to this favoured soil, to develope its resources. I have seen oxen, sleek and fat even, like those from the rich marshes of our land; Caffir cows, for beauty and colour equal to our Ayrshires; draught oxen large and well-formed, like our English cross breeds.

Often have I envied the happiness of the Caffir, with his goats and sheep, his cows and calves, his milk and grain, his life how simple, his wants how few! Thousands of acres of land are wanting inhabitants, which can be bought at any price, on any terms to suit the circumstances of the comer. One spot I passed, the settler had a run of eighteen hundred acres of grass, and one hundred acres of arable land, for £8 a-year rent.

On the Mooi, or Beautiful River, there are spots of enchanting loveliness: the river wide and uniform, like a canal formed by art and labour, winding through valleys of luxuriant grass. Here are farms to sell and let, one of which is called the "Farm of the Golden Valley," intersected by the river, and covered with the thorn bushes of the mimosa. In this neighbourhood, sheep are found to thrive; and the soil grows every necessary the farmer can desire, for use or sale.

On the Tugela, two days' journey from the Drakensberg Mountains, I visited a family of Dutch farmers. Its members owned amongst them two thousand head of cattle, twelve hundred of them being heifers and cows in calf. It was quite a patriarchal scene to see the old Boer surrounded by his sons and daughters, with their children, all engaged in tending the herds, or making butter, soap, candles, milking, and tailoring. Weeping willows o'erhang the watercourse. An orchard of almonds, peaches, apricots, and other fruit-trees extended to the banks of the river. In the midst of the water a large island arose. On this the cattle were kraaled every night, when coming home at sunset, attended by the herdsmen. The vast number of cattle had the appearance of Barnet fair. The Dutch practice of churning the milk at every meal was followed; and so much milk was thrown away that around the buildings the ground had the appearance of snow, from the waste milk bleaching in the sun. I found these Dutch farmers happy, comfortable, thriving, and wealthy, anxious for neighbours, communicative, and hospitable, and disinterestedly kind. All that this fine country wants is inhabitants. Millions of acres are unoccupied that might be supporting our over-burdened, over-taxed, and struggling farmers. Young Englishmen with their wives, possessing from £200 to £500, with common prudence and ordinary success, could not but in a few years acquire a competence. I know no nobler enterprise in which a benevolent capitalist could engage, than going over with a party of farmers selected for colonizing some of the large tracts of country now an unproductive wilderness, but that might be converted into fruitful farms, supporting a rural population. Dr. Mann, the Government agent, a resident for nine years in the colony, and Superintendent of Education, is now in England, and wishes to meet with farmers of small capital, who, paying their passage out, will receive a land order for 200 acres of average Crown land, and also the privilege of purchasing other 200 acres lying contiguous to his grant, for 10s. per acre; or in the upper districts lands can be leased from 1d. to 2d. per acre. Stock and sheep can be obtained on most reasonable terms; in fact, such is the paucity of farmers that the colonists will hail with satisfaction the arrival of emigrants, who would receive a helping welcome from all classes.

On the subject of sheep farming, this pursuit is progressing. I had thought it a doubtful enterprise, but facts are overcoming theory—sheep are thriving on many farms in the midland and upper regions of the colony. A stock-owner writes me that there are difficulties, but they are not greater than occur at home—a flock needs constant attention; in summer they require watching, that the rich nutritious grasses do not produce hove and blow them; in the winter months, when the pasture or veld is dried up, sheep may be allowed to feed upon low lying lands, care being taken to fold them at night. I knew a successful sheep farmer of the Orange Free State that used to bring his ewe flock down the Drakensberg to lamb among the rocks and shelter of the Tugela sources, being warmer than his highland farm. In most countries there are situations where sheep invariably get very fat, and afterwards die off rapidly with a species of rot. Rock-salt is found by the colonial flock-masters an excellent preservative. In Spain the flocks are brought to it twice a day, besides having access to it at night. Sheep should be kept away from swampy ground. Pumpkins should be grown in the rainy season, for fresh fodder through the cloudless six months. Tobacco water (hot as the hand can keep in it) cures the scab. A heavy thunder-storm frightens a flock into heaps, causes them to be thoroughly heated and chilled, which often ends in cold, inflammation, and death, unless they are properly and carefully tended, on which account small flocks are more easily managed and pay better than large ones. A disease called the blue-tongue is very fatal to sheep at Natal, but a simple remedy is found in 25 drops of muriatic acid to a wine-glass of water morning and evening.

Natal needs farmers with capital more than any other class. Of store-keepers, and land speculators, and hungry lawyers, there is more than enough. There is unlimited scope for sheep farmers and sugar and coffee growers, but the general emigrant is not encouraged to this colony, coloured and native labour being cheap and abundant.

The Orange Free State, with its short sweet grasses and boundless plains, is preferred by some for sheep. Emigrants who would feel the climate of Natal too relaxing would find in this high region (which is 5,400 feet higher than the Bay of Natal) a temperature more suited to English habit. In the winter months frost and snow are common, and the summer heat is not so oppressive as the coast of Natal. I am prejudiced in favour of the Free State, with its excellent pasturage suited for sheep, more like our downs and sheep districts at home than any other part I have travelled. The want is inhabitants. One may journey for fifty miles at a stretch without meeting with a settler. Its enormous plains, covered with masses of game, black wilde beest, grazing on the flats like Welsh cattle, and the fleet quaggas bounding along in troops, with mixed herds of hartebeest, blesbok, and other game, give sensations of pleasure to the sportsman unknown at home. I have known a party of sportsmen to go out with saddle-horses, oxen and waggon, returning at even loaded with slaughtered animals. So abundant and fat do the quaggas get in summer, that a very intelligent Frenchman, farming in the Wittbergen, suggested a company for shooting these animals, and boiling them down for the oil, tallow, and other valuable parts. The State contains nine large rivers and innumerable streams, often fringed with belts of mimosa, and well adapted for sheep, goats, and cattle, for which a ready market is always open with the Cape Colony. In the neighbourhood of Harrismith, the first town over the Drakensberg, agricultural farming can be carried on to any extent without irrigation. Wheat of the finest quality in Africa is produced in this district. Unlike most of the sheep farms in the Cape Colony, almost every farm has water for all purposes. Farms of several thousand acres in extent, or parts of farms, suitable for building a house and farm buildings, with a water-stream generally thereon, can be obtained from 5s. an acre upwards. Some farms a few weeks ago were advertised at 1s. 6d. an acre. I have some friends farming in the Free State who make upwards of a thousand a year by sheep, from an original outlay of £1,250—a remarkable instance of what may be done with a small capital, and proves that sheep farming at the Cape is not, as often represented, less lucrative than in Australia, New Zealand, or even the last "new land of promise," the "Argentine Republic."

Should any of your readers desire minute particulars respecting these colonies, Messrs. Savoury, of 1, Martin's-lane, Cannon-street, London, and Dr. Mann, 15, Buckingham-street, Strand, London, will, I have no doubt, supply information with pleasure.—Yours, with respect,

W. I. Irons.

Foliejon Park, Windsor, March 20.

P.S. I send by this post the conditions of Government land grants at Natal. At a late auction sale of farms in the Free State they averaged £86 each.

[It is only right to say that Mr. Irons is himself the author of a Guide Book to Natal; and that Dr. Mann, who is shortly to read a paper on Natal, at the Society of Arts, is the Emigration Agent for Natal. Any high colouring in the above letter must be toned down accordingly.—Editor.]

AGRICULTURAL EDUCATION IN SCOTLAND.

By a supplementary charter, under the Great Seal, granted in 1856, the Highland and Agricultural Society is empowered to prescribe a curriculum for Agricultural Education, and to grant diplomas. The Council constituted by this charter recently reported that there should be two examinations—namely, one for the certificate and one for the diploma, that the examinations should be both written and oral, that the value of the answers should be determined by numbers, and that the oral examination should be public. The first examination, under this report, took place in March last year, when two candidates received the certificate and diploma.

This year's examinations, which commenced on Monday, terminated Wednesday afternoon, having extended over three days—Monday and Tuesday being set aside for the written and Wednesday for the oral examination, which was open to the public. Among those present were—Professor Lyon Playfair, C.B.; Mr. Henry Stephens, author of "The Book of the Farm;" Mr. Fletcher Norton Menzies, secretary of the society; Mr. Douglas, of Killiechassie; Mr. Cecil Johnstone Douglas, of Lockerbie.

The subjects of examination, and the several examiners present, were as follows:—Science and Practice of Agriculture, Mechanics and Construction—Professor Wilson and Robert Russell, Pilmuir. Botany—Professor Balfour. Chemistry—Professor Anderson. Natural History—Professor Allman. Veterinary Surgery—Professor Hallen. Field Engineering and Surveying—Professor Macquorn Rankine. Book-keeping and Accounts — Kenneth Mackenzie, C.A, and Archibald Paterson, Meadowfield.

The following gentlemen passed the necessary examinations: *For Certificate and Diploma*—1. Robert Brydon, Burncastle, Berwickshire; 2. George Kent Walton, Long Compton, Warwickshire. *For Certificate* — 1. James Cooper Bowstead, Halkthorpe Hall, Penrith; 2. Thomas John Elliott, Wilton, Salisbury.

A meeting of the Council on Education was held at the close of the examinations—Mr. Henry Stephens, in the absence of the president and vice-president, in the chair—when the report by the Board of Examiners was received, and certificates and diplomas were authorized to be issued to the successful candidates.

FOREIGN AGRICULTURAL GOSSIP.

The French district State agricultural shows for 1867 are now announced. They will take place as follows:—From May 4 to May 12, at Bordeaux, Blois, Carcassonne, and Troyes; from May 11 to 19, at Aurillac; from May 18 to 26, at Vannes; from May 27 to June 2, at Tarbes, Amiens, Bourg, and Digne; and from June 1 to 9, at Caen. The different meetings have been arranged so that it may be possible for the same agriculturists to visit several of them. This is a happy idea, which may attract many strangers into French provincial towns during the time that the shows are being held, as it will be more instructive to go and see the various French breeds of cattle at the district meetings, where, besides, each breed will be more numerously represented. The district State agricultural shows have played a great *rôle* in the agricultural "transformation" of France; they belong, in the full sense of the term, to that happy spirit of decentralization, of which agriculture more than any other industry is interested in favouring the development. Two important reports officially addressed by Dr. Jules Guyot to the French Minister of Agriculture, Commerce, and Public Works, to the viticulture of the north central and western districts of France, were issued at the close of 1866. The interesting studies to which they relate were made by Dr. Gayot in the north-central district of 1864, and in the western district in 1865. These two districts comprise 16 departements—eight in the north-central: the Cher, the Allier, the Nièvre, the Saône-et-Loire, the Côte-d'Or, the Yonne, the Aube, and the Loret; and eight in the western: Corsica, the Charentes, the Viennes, the Indre, the Haute-Vienne, the Deux-Sèvres, the Vendée, and the Loire-Inférieure. These 16 departements added to those previously explored carry to 64 the number of the departements studied from a viticultural point of view by Dr. Jules Guyot, out of the 78 departements in which the vine is cultivated. Since July 1, 1866, the manure trade in Wurtemberg has been submitted to the control of a special experimental bureau established at Hohenheim. This control, which is purely permissive, aims, on the one hand, at furnishing cultivators with a guarantee of the good quality and value of the manures recommended by the experimental bureau; and, on the other hand, it aims at encouraging the employment of substances which are calculated to play an important part in cultivation, but which, from motives often too well founded, are still the object of a certain distrust. The new establishment will involve Wurtemberg cultivators in no outlay, as the Wurtemberg Central Society of Rural Economy has assumed the charge for one year, viz., from July 1, 1866, to July 1, 1867. The whole of the measures of control determined on between the society and the Hohenheim experimental bureau apply directly only to the commercial manures, the composition of which is nearly identical, and the quality of which may be promptly and surely indicated by chemical analysis. Among these manures are the guano of Peru, Baker guano, Norwegian fish guano, powder or flour of bones, superphosphates of all kinds, and the Stassfurt salts of potash. The bureau does not propose to admit to the control established artificial guanos or mixtures specially adopted to such or such determined plant. At the same time this exclusion is not absolute, and the establishment announces that it is disposed to lend its advice and assistance to the manufacturers of this description of manures from the moment that experience shall have shown that the mode of fabrication adopted with these mixtures, and the nature of the materials which enter into their composition permit, a product of good quality to be obtained, and the composition of which is nearly invariable. But the trials must be seriously made, and with this object the bureau imposes on the manufacturer the obligation of furnishing him with all necessary information as to the mode of fabrication; and, further, by giving free access in his workshops and warehouses to the agents who may be appointed to visit them. As regards bone-powder, which is one of the commercial manures most in use in Germany, account must be taken in an appreciation of it, not only of its chemical composition, but especially of its mechanical preparation and of the fineness of its grain. Bone-powder containing 3 to 4½ per cent. of azote, and 22 to 27 per cent. of phosphoric acid, constitutes from that very fact an excellent manure. But its effect, which may be prolonged during two or three years, can only be prompt, energetic, and complete as it presents itself under the form of an extremely divided bomogeneous powder, all the grains of which have the same fineness. In the north and centre of Germany, bones broken into large pieces, the use of which was generally adopted, have given place to a fine powder obtained by heating the bones with steam, and then reducing them to the greatest possible state of division. At the same time, the action of the broken bones may be accelerated by mixing them with horse or sheep manure, and watering the whole with sewage or liquid manure. The Hohenheim bureau appears to have come to the conclusion that if bone-powder, even the largest, has a certain value for the cultivator, it is not the same with superphosphates, which it pronounces generally poor in phosphoric acid. It may be convenient to add that Stassfurt salts of potash are an altogether local product, the major part of which comes from the manufactory of Dr. Franck at Stassfurt itself. Pure sulphate of potash from this source contains 10 to 11 per cent. of alkali. If German agriculture is displaying proofs at present of great activity, it is, for the rest, powerfully stimulated by the incessant progress of local sugar-producing industry. This industry comprises in the States of the Zollverein no fewer than 293 manufactories in activity, of which 250 are in Prussia, 3 in Hanover, 1 in Electoral Hesse, 5 in Bavaria, 1 in Saxony, 6 in Wurtemberg, 1 in the Grand Duchy of Baden, 2 in Thuringia, and 24 in Brunswick. Between January and August, 1866, these works consumed 1,775,708 tons of fresh beetroot, and paid in taxation a sum of £665,892. Calculating on an average return of one ton of rough sugar for 12½ tons of beetroot, we arrive at a total production of 142,056 tons of rough sugar. Perhaps this total is a little below the truth, as the Prussian authorities calculate the return at the rate of one ton of rough sugar for 11 tons of fresh beetroot, although the Prussian sugar-makers deny this estimate, and ask that the basis adopted for the payment of the tax levied may be changed, and that the drawbacks on the exportation may be increased. The administration of the Zollverein does not appear very ready to adopt this course; it does not deny that it is to the interest of sugar-producers to extend their outlets abroad, but it deems it useless to accord them a premium on exportation and to facilitate the export movement at the risk of bringing about a rise in the price of sugar in the home districts. Whatever may be the complaints made by German sugar-producing industry, it is worthy of remark that the number of manufactories increased 25 in the interval between one season and another. Thus while there were 268 works in 1864-5, the number rose in 1865-6 to 293. Notwithstanding the increase in the number of the works, the production of sugar experienced a relative diminution; but this result is explained by the ordinary quality of the beetroot treated, the return falling below the average. Among the 25 recently created works, 16 were established in Prussia, two in the Principality of Anhalt, two in Hanover, and six in the Duchy of Brunswick. The total here shown is 26, but the real augmentation is reduced to 25, in consequence of the abandonment of one establishment in Bavaria. Calculated on the bases recently indicated, the production of rough sugar for the whole season of 1864-5 was 3,391,296 tons, while in 1865-6 it was 3,476,222 tons. The exportation has also acquired a great development, as may be inferred from a comparison of the total drawbacks allowed, which amounted to £33,731 in 1864-5, while they rose in 1865-6 to £191,736. These drawbacks represent an export of 8,175 tons of rough sugar in 1864-5, and of 46,483 tons in 1855-6. It would appear from these statistics that the sugar-producers of the Zollverein have no just grounds for complaining of the impediments which existing legislation offers for the development of their industry, both at home and abroad.—A royal ordonnance has recently authorized the establishment, at Coeslin, of a Land Mortgage Bank of Pomerania. The capital of this bank has been fixed provisionally at £120,000, but it may be carried eventually to £1,500,000, subject to the authority of the Government and the assent of the shareholders. The mortgage operations of the bank are to be concentrated preferentially in Pomerania, and cannot in any case extend beyond Prussia. The bank may pay the amount of its loans either with its own bonds or in specie. At the same time the borrower who has been obliged to accept bonds in payment, according to their nominal value, preserves expressly the right of effecting the repayment in the same manner.

The Compiègne Society of Agriculture has devoted much attention of late to the question of the cattle-plague in connection with the approaching Paris Universal Exhibition. It has expressed a wish that animals of the bovine race should not be admitted to the exhibition. The French administration of agriculture has also preoccupied itself with the dangers which may result from the collection of a number of beasts coming from districts invaded by the rinderpest. This is why it has not yet decided on the district show which should take place at Colmar in 1867. It is proceeding at present to an inquiry in the departements of the East, as it is there especially that French agriculture is near the dreaded enemy. While it is not desirable that the Administration should abandon itself to exaggerated fears, it must be admitted that a great responsibility rests on the Government. High functionaries are sent to all the points at which danger is reported, and the sanitary service is perfectly organized; so that there is little reason to fear that, with such care lavished on the frontiers, due precautions will be neglected in all the collections which are likely to be met with, not only at the Universal Exhibition, but, still further, at all the state district shows. At the latter meetings, it appears that all animals of the cattle species will not be permitted to enter until they have undergone a serious inspection from veterinary surgeons specially appointed for the purpose. It will probably be the same at Billancourt, where will be held the cattle-show in connection with the Universal Exhibition. On the application of the municipality of Bordeaux, the district show of 1867, which ought to have been held at that town from May 4 to May 12, is adjourned to the eight days comprised between the 11th and 19th of the same month. As regards the Colmar meeting, its date will be fixed as soon as an inquiry instituted in the departements of the East of France with reference to the prevalence of cattle-typhus beyond the Rhine has placed the administration of agriculture in a position to take a decision in accordance with the interests of local agriculture. Apropos of the district state agricultural shows, we may note that the towns of Amiens and Troyes are preparing horse shows, which will be held at the same time as the district shows, of which those towns will this year be the centre. All this is very well, as horse-breeding is quite as much an agricultural work as the production of other domestic animals; but it is not very clear why breeders of horses should, often against their real interests, set themselves apart at French agricultural meetings. This is an agricultural heresy, against which too many protests cannot, perhaps, be made until the Minister of Agriculture, devoting himself to the general interests of the production of stock, centralizes all agricultural interests without exception. Meanwhile important modifications are introduced into the State district shows of 1867. The directors of farm schools will cease to compete for the prize of honour with cultivators working at their own risks and perils, without any administrative assistance. But as it was not just that men having rendered very great services to agriculture should be completely excluded from departmental struggles, it has been decided that the farm-schools should be examined with a view to the adjudication by the juries of some rewards; and a special prize of honour, consisting of a silver cup of the value of £100, may be awarded to the directors of farm-schools for the whole of their cultivation. If it is deemed advisable to recompense partial improvements, it is a gold medal, and not a silver cup, which will be awarded. As regards the instructing staff, or the agents attached to the cultivation of the prize farm-school, they will participate in the distribution of the sum of £20, which will be put with this object at the disposal of the jury. By another arrangement, a gold medal, a silver medal, and a bronze medal are attributed to the finest collection of improved ploughing implements, presented by agriculturists successfully using the various implements on their workings. If all the arrangements are carried out, they appear likely to have the effect of only admitting for competition really valuable collections of implements which have given proof of practical utility on the land and in the farm. In other words, show implements will cease to present the dangerous testimony of medals which cannot really be justified by useful results. District exhibitions of fat stock will take place April 9 at Chateauroux, Lille, Nancy, and Nîmes; April 10, at Bordeaux, Lyons, and Nantes; and April 17, at Poissy. The farm-school of Pailboreau (Charente-Inférieure) is about to clear off some of its stock. The animals offered will be the following: Males—Niram, born June 26, 1864; Biron, born April 1, 1865; Nadiro, born Aug. 4, 1865; Nadir II., born Sept. 5, 1866; and Nadirus, born Sept. 23, 1866. Females—Nanette, born Aug. 10, 1864; Nirame, born July 11, 1865; Néranie, born Feb. 23, 1866; and Narie, born Oct. 2, 1866. The death is announced of M. Jean-Elie-Benjamin Walz, corresponding member of the Institute, and honorary-director of the Observatory of Marseilles, who died lately in that town at the age of 84. M. Walz showed himself much devoted as a *savant* to the interests of agriculture. The death is also announced of M. Arnould, president of the Imperial Society of Agriculture of Algeria. Profoundly attached to the common interests of the Algerian colonists, M. Arnould had given many proofs of his devotion to Algeria as a French colony. The superior commission of the official *enquête* into the condition of French agriculture has held a general sitting under the presidency of M. de Forcade, Minister of Agriculture, Commerce, and Public Works. We believe the commission shared between its members an examination of the reports of the various district presidents and of the numerous documents collected in the departements or abroad, and that it decided further that it would hear subsequently the depositions of various persons who will be called before it to complete the information which it requires. Finally, the commission decided that the sub-commissions should indicate the documents which they consider should be published, and that they should propose the form in which this publication should be made. Everything appears likely to take a serious turn, and it will not be surprising if important decisions are taken as soon as the commission completes the various special parts of its vast work. What the country districts of France require is labour, capital, and ideas working harmoniously; and this result is likely to be attained by the laying together of some of the best heads of the empire. An interesting speech has just been made by M. Louis de Kerjegu, president of the agricultural committee of Châteauneuf, Finistere, on the duties of rural proprietors. M. de Kerjegu said: "With pleasure I see the sons of great and honoured proprietors of my arrondissement accept the task of visiting farms, forming part of juries, and showing themselves able in their advice and ardent in their devotion to the populations round them, who reward them with their esteem and confidence. But these visitors appear rarely; and seeing the great good produced by so small a number, think of the immense benefit which might be effected among us if the sacred voice of duty spoke more decidedly and effectively. From Dunkerque to Bayonne, proprietors, inhabit your estates; unite yourselves; associate yourselves; work the rich sea-deposits on your shores; make railways and roads; restore richness and power to your lands; break them up, drain them, submit them to a reasonable system of croppings. In a word, proprietors, do your duty! Labour is an effort, it is true; but it is a duty and a necessity to overcome obstacles, prevent sufferings, and procure wealth and comfort." Alluding to the threatened danger of the French markets being flooded with Russian Wheat, M. de Kerjegu added: "Our intelligence is equal to that of the Russians. The sea, our calcareous deposits, the potash of our feldspar, our waters—such are the elements of restoration which, instruction, good sense, and courage aiding, will maintain our lands as fertile and fruitful as the much-vaunted fields of Russia. But further, as M. Lecouteux has so well observed, our climate, by its mildness and variety, will always enable us to secure an arrangement and variety of crops such as are impossible under climates admitting only a very limited choice of products. Finally, the English market will always remain open before us. To reach England, we reckon the time by hours, while the Russians and Americans have to calculate it by days or weeks. While Dunkerque, Havre, and St. Malo are within six to ten hours of England, Odessa is almost as many weeks." Ingeniously put, M. de Kerjegu; but not entirely conclusive, notwithstanding.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MARCH.

Notwithstanding that the weather in all parts of the United Kingdom was very severe during the first three weeks of the month, our accounts, with very few exceptions, are favourable as regards the young wheat-plants. Though backward, owing to strong frosts and heavy snow, they are looking well, especially upon the heavy soils. Most of the spring corn has been sown, so that out-door labours are well in their place.

The arrival of an enormous fleet of vessels off the coast from the Black Sea ports, and which were mostly laden with wheat, has had very little influence upon the wheat trade, either here or on the continent. English wheats have come slowly to hand, but the demand for them has been in a most inactive state. As regards prices, we may observe that very little change has taken place in them, compared with the previous month. The sale for foreign wheat has been trifling, but no decline has been submitted to by the holders. The fact appears to be that most of the foreign wheats now in this country are held in strong hands. Great inactivity has prevailed in the barley-trade, on easier terms. Malt has been much neglected, and lower in price, owing to the large quantities of sugar which continue to find buyers for brewing purposes. An extensive business has been passing in oats, on rather higher terms. Beans, however, have fallen 1s. to 2s. per qr. Peas and flour have been steady in price.

On the continent, both wheat and flour have sold at full quotations. Numerous heavy contracts have been entered into at Odessa, &c., for the shipment of wheat in April, May, and June. In the value of barley and other articles very little change has taken place. American advices bring very high prices for all kinds of produce. As they are considerably above the views of shippers, we are not likely to receive much grain from that quarter for several months.

Although an immense quantity of colonial wool has been offered at public sale, nearly the whole of the supply has changed hands, partly for export to the continent, but at a decline in the quotations compared with the November auctions of 1d. to 2d. per lb. Privately, very little business has been passing in any kind. The enhanced duties now payable in the United States on wool have, no doubt, had much effect upon prices here. The duty on wool is now 10 to 12 cents per lb. on the best qualities, with 10 to 11 per cent *ad valorem*, and 3 to 6 cents on inferior. Low woollens pay 20 to 25, and the best 7 to 12 per cent.

Most of the leading markets have been seasonably well supplied with potatoes. Prices, however, have had an upward tendency—170s. per ton having been paid for the best qualities. Apparently, there is some quantity remaining in the hands of the growers. The imports into London from the continent have been on an average scale.

Fair average supplies of hay and straw have been on offer, for which the demand has ruled steady, as follows—Meadow hay £2 15s. to £4 12s., clover £4 to £5 10s., and straw £1 18s. to £2 6s. per load.

The hop trade has been in a most depressed state. Scarcely any transactions have been reported; prices, therefore, have been almost nominal.

For linseed, rapeseed, cakes, and agricultural seeds, there has been a fair demand, at extreme quotations to a slight advance.

In Scotland, the few samples of wheat brought forward have produced rather more money. Spring corn has been steady in value.

In Ireland, very little change has taken place in the prices of wheat. Barley and beans have ruled in favour of buyers, but other articles have been tolerably firm.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the show of English and Scotch beasts in the Metropolitan Market have been only moderate, the aggregate supply of stock, arising from a steady influx from abroad, has been moderately good and in prime condition. The trade on the whole, owing to the large quantities of meat disposed of in Newgate and Leadenhall, has been inactive, and in some instances prices have had a drooping tendency. The leading figure for the best Scots and crosses has been 5s. 2d. per 8lbs. As usual, the Scotch beasts have arrived in very prime condition.

Only moderate supplies of sheep have been brought forward. Prime Downs and half-breds, including Lincolns and Leicesters, have sold steadily at full prices; but inferior sheep have gone rather lower.

Lambs have come somewhat freely to hand, and been disposed of at from 7s. 4d. to 8s. per 8lbs.

There has been a good sale for calves at extreme rates. The supply has not increased.

The sale for pigs has been heavy in the extreme, and a severe fall has taken place in prices.

The imports of foreign stock into London during the month were—

	Head.
Beasts	6,960
Sheep	26,200
Lambs	120
Calves	950
Pigs	470
Total	34,700

Imports at corresponding periods:—

Total in March, 1866	51,869
„ 1865	25,719
„ 1864	18,104
„ 1863	15,644
„ 1862	6,259
„ 1861	9,091

The total numbers of stock exhibited were as under:—

Beasts	14,460
Cows	130
Sheep	95,600
Calves	1,100
Pigs	1,800

COMPARISON OF SUPPLIES.

March.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1866	15,511	60	117,550	1,075	2,205
1865	22,400	577	86,752	1,142	3,015
1864	21,500	512	91,890	1,218	2,690
1863	18,653	501	88,560	935	2,432
1862	18,200	500	83,040	881	2,810
1861	18,500	530	85,270	700	2,410
1860	18,160	495	93,409	853	2,042
1859	16,810	612	94,775	695	2,890
1858	17,821	476	74,410	704	1,915
1857	17,345	490	74,880	1,118	2,230
1856	22,623	470	100,700	797	2,140

The principal receipts were from Norfolk and Suffolk, which furnished about 6,300 Scots and crosses. Those from Ireland and Scotland were trifling.

COMPARISON OF PRICES.

	March, 1863.	March, 1864.
	s. d. s. d.	s. d. s. d.
Beef from	3 4 to 5 0	3 4 to 5 0
Mutton	3 6 to 6 2	3 8 to 6 0
Veal	4 2 to 5 6	4 0 to 5 4
Pork	3 8 to 4 8	3 6 to 4 6
	March, 1865.	March, 1866.
	s. d. s. d.	s. d. s. d.
Beef from	3 6 to 5 4	3 4 to 5 2
Mutton	4 6 to 6 8	3 10 to 6 2
Veal	4 6 to 5 8	4 4 to 5 6
Pork	3 6 to 4 10	3 2 to 4 4

In Newgate and Leadenhall the quotations have been as follows: Beef from 3s. to 4s. 8d., mutton 3s. 4d. to 5s., veal 4s. to 5s. 2d., pork 2s. 10d. to 4s. 4d. per 8lbs. by the carcase.

BERKSHIRE.

The new year came in with frost and snow, and has continued so almost without interruption up to the present time. Many of the evergreen shrubs are killed, and most of the choice roses; as are also the brocoli and green vegetables for spring use. The swedes and mangolds have also suffered much, and a great many acres of the young wheat look but sadly. Field-work has been much delayed, and farm-horses have done but little lately towards earning their keep. But little of the spring corn has as yet been planted; and now the land is so thoroughly wet that it must be some days before we can get on the land to plant anything satisfactorily. We have had a succession of damp weather for nearly eighteen months, which will tell upon the land for some time. The plants of young wheat before the frost set in were not very good, and now we fear a great deal of it is seriously injured; but we must hope for the best, and as we are having so much frost now, we may be spared later in the spring. The plants of young clovers and grasses are good. Rye and tares also look pretty well, but spring keep does not look at present likely to come in very early. Our wheat markets have varied considerably lately, but prices have been good, and now they are higher than they have been for some time. The wheat does not yield well, and will scarcely come up to an average. As little else could be done on the farm, thrashing has gone on as fast as the weather would permit; and there is certainly not more than the usual proportion in the farmers' hands. The barley is nearly all thrashed, and prices have ruled high. Many of our large maltsters have discontinued purchasing for some time, and several of the brewers have now taken to use sugar with the malt, on the score of economy. But few of the oats are good in quality, as they stood out so long in the wet at harvest; neither do they yield well. Beans yield fairly, but continue soft, there being no weather to harden them. Peas we think the best crop of the year, and have been the cheapest article to feed with all the winter. Grass seeds do not turn out well, and are indifferent in quality. Our meat markets are amply supplied. Beef sells readily at full prices. The returns for mutton were not so good early in the year, but latterly it has sold better. But little veal is made, but sufficient for the demand. Good fresh-calved cows have been in great demand, and many farmers who suckled have been induced to sell their cows. We have not much alteration to report in the price of pork or fat hogs; the latter have been selling at 10s. per score, and pork at a trifle higher. The trade in store sheep has been slow, and although prices continue high, there has not been much profit realized for wintering them. They were bought in dear in the Autumn, and the weather has been such that they have not gained much in condition. The lambing season is nearly over, and although some flocks have not done well, still, on the whole, the increase is satisfactory. The trade in store pigs is dull, and as our markets and fairs are still closed, we cannot report on store beast and young cow stock. We hear of but little doing in wools. Good horses, either nags or carts, sell well, and are scarce, and the supply of middling young cart horses is short. Hay is dull of sale, without variation in prices. Straw sells readily, and is scarce. A great many potatoes were injured by the frost, and they are dear to purchase. Labour is plentiful, and scarcely all hands are employed.—March 22.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

AXMINSTER NEW MARKET.—Cows and calves from £12 to £15, one lot fetching £17 10s., barreners £11 to £13, heifers £8 to £10. Sheep were not numerously represented, but in good demand; there were no fat sheep shown; ewes and lambs may be quoted at about £3 per couple, and hoggs 40s. to 45s.

BOSTON SHEEP MARKET.—An average supply of fat sheep, in wool sold at 8d. per lb., out of wool 6½d. There was a fair show of hoggs, and prices were about the same as last week.

BROMYARD FAIR.—There was a very small supply of stock and very few purchasers attended. Cows and calves and store stock sold well. Sheep brought a good price, and pigs sold higher, but there was nothing doing in horses.

DUMFRIES PORK MARKET.—The number of carcases was 509, or 79 less than last week. The weather continues very severe, with frost and north-easterly winds, and the carcases were in excellent condition for the curers. The attendance of buyers was fully an average, and there was a quick demand; buyers were firm, however, against any advance, and prices were similar to those of last market. For prime carcases, 12 to 13 stone weight, prices were 6s. 7d. to 6s. 8d. per imp. stone, secondary qualities 6s. 5d. to 6s. 6d., small light carcases and carcases by rail 6s. to 6s. 3d.

ELGIN MONTHLY MARKET. — The attendance of dealers from the South was unusually large; but the show of stock was somewhat inferior. Anything like fat commanded a ready sale at good prices. Mr. Sim, Ringorm, Knockando, sold a lot of stots, two years old, at £16; Mr. Weir, Innes House, sold two queys at £34; Mr. John Young, Dallas, sold a stot at £24; Mr. Cooper, Spynie, sold a quey at £17 10s., and a lot of stots at £21 10s.; Mr. William Riach, Hillhead, Rothes, sold two queys at £24; Mr. Mitchell, Lochinver, sold a cow at £26, and a lot of stots at £21; Mr. Reid, Salterhill, sold four queys at £16 10s. a-head; Mr. Reid, Burnside, sold two stots at £42; Mr. Walker, Philaxdull, sold a lot of polled stots at £22; Mr. Adam, Thornhill, sold a lot of stots at £26. Horses being much in demand at present, met with a brisk sale.

GRANTHAM FAT STOCK MARKET.—A good supply of sheep, and very brisk trade. Mutton in the wool 8d. to 9d. per lb., out of ditto 6d. to 7d.

LINCOLN FAT STOCK MARKET.—A small show of wethers, and clipped sold at 7d. and 7½d.

MEIGLE MONTHLY MARKET.—The following are a few of the principal transactions in cattle, which ranged about 10s. 6d. to 11s. per stone. Mr. Murray, sold five at £22 10s.; Mr. Scot, Kinpurnie, eight at £22; Mr. Mount, Castleton, six at £23 10s.; Mr. Bell, Auchtertyre, eleven at £23; Mr. Kidd, Aucteralyth, three at £19 10s.; Mr. D. Pattullo, Fullarton, three at £16 10s.; Mr. A. Gellatly, Myreside, three at £19, and six at £15; Mr. J. Saunders, Newtyle, four at £11; and Mr. A. Baxter, three at £12 10s. A number of Irish stirks were sold at £6 2s. 6d.

WELLINGTON FAIR.—There was not a very large supply. Mr. Bird, Westford, had 30 wether hoggs; Mr. Bond, Perry Elm, had 40 hoggs; Mr. Corner, Longforth, 40 hoggs; and Messrs. Martin, Hitchcock, and others, also showed considerable numbers. Prices were very high, and but little business was done. No fat sheep changed hands.

WORCESTER FAIR.—The supply of stock was not very large and prices were dull. The auctioneers sold a number of sheep, which realised prices varying from £3 11s., £3 12s. 6d. to £3 14s., and store pigs were a little lower in price. Upwards of 300 sheep, including some very superior fat sheep, realized prices varying from 55s. to 65s., ewes and lambs 70s., and tegs 47s.; also a number of fat and store pigs sold well.

IRISH FAIRS.—ATHLONE: The pig fair was dull, and with great reluctance holders accepted the prices offered, which varied from 39s. to 41s. per cwt. Some very heavy animals were sold as high as £8 5s.; stores were worth from 25s. to 40s.; bonhams 21s. to 30s. per pair. Good springers were worth from £16 to £21, general value £10 to £16; heifers ranged from £6 6s. to £16, according to age; some prime lots reached £16 10s. each. Dry cows £8 10s. to £12 10s. Fat beasts scarce. Beef brought from 54s. for inferior to 62s. for prime samples. Wether mutton stood between 6½d. to 7d., ewe 6d. to 6½d. per lb. Store sheep hard to dispose of. The horse fair was of the usual ordinary character; general value £12 to £30.—Baltinglass: Milch cows, which were few, went at extremely high prices, viz., £13 to £15, three-year-old £11 to £14, two-year-old £9 10s. to £11, year and a-half from £8 to £9; two-year-old ewes from 40s. to 45s., ewe hoggets from 38s. to 40s., ewes with lambs from 50s. to 55s. Pigs were scarce, and buyers were but few. Bacon pigs sold at about 43s. per cwt., and pork at from 44s. to 46s.—Callan: In-calf cows of good bone, and likely to drop next month, fetched from £12 10s. to £16 each; new milch cows £14 to £17 10s., and strippers £8 10s. to £11. Three-year-old heifers were nimbly picked up, at £13 to £15 per head, two-year-olds £9 10s. to £12, and yearlings £7 to £8 15s.; three-year-old bullocks £11 to £12 15s., two-year-olds £7 10s. to £9, and yearlings £4 10s. to £6 10s. each. Calves of ten months old were purchased at from £3 to £4 10s. per head in the run. A few sales took place in the beef department, at about 3 guineas per cwt., sinking the offal. Mutton 6½d. to 7¼d. per lb.; sheep, with lamb at foot, 56s. to 64s. each; ewe hoggets 40s. to 52s.; and lambs, twelve months old, 32s. 6d. to 40s. Store pigs very cheap; bonhams 17s. 6d. to 25s. per couple; and strong pigs, for fattening, 38s. to 45s. per head.—Camlough: Beef cattle sold at 7d. per lb.; springers, the quality of which was of a fair average description, brought from £9 to £17. Strippers and milch cattle were both fairly supplied, the former averaged from £10 to £13, and the latter from £7 to £12. The prices of young cattle ran very high.—Dundalk: Prime beef realized fully from 7d. to 8d. per lb., middling and inferior 5d. to 6½d. per lb. The following were some of the principal transactions: Mr. Marmion, Kilcurley, sold the finest lot of bullocks in the fair, to Mr. Collins, Dundalk, at £28 each; he also received £16 each for a lot of three, and £20 each for another lot of the same number; Mr. Flynn, Drumbillah, received 30 guineas for a magnificent ox; Mr. A. Dickie sold a superior lot of bullocks at £23 10s. each; Mr. M'Cullagh, Mullaharlin, sold eight good beasts at £21 each. A few milch cows sold at good prices, ranging from £14 to £20. Good store cattle were in demand; two-year-olds £4 to £6, yearlings £3 10s. to £4. Mr. H. Kiernan, Cappagh, sold his lot of wedders to Mr. Collins at 60s. each, being fully 8d. per lb. Mutton on the whole brought from 6½d. to 8½d. per lb. Bacon may be quoted at from 45s. to 47s. per cwt.—Kanturk: First-class beef was 70s. per cwt. Unfinished beasts were in dull inquiry, and rated at from 40s. to 60s. per cwt. Springers were not much sought after, and changed owners at from £10 to £14. Mr. P. Johnson received fourteen guineas for one. Strippers were in good demand, but the quality shown was inferior; the rates were from £8 to £13. Mr. Walpole sold four at £13 a-head. The sheep market was small; mutton from 7d. to 8½d. per lb.—Skibbereen Fair: The show of cattle was large, but there was very little business doing. A few good milch cows were picked up at a smart price. In dry stock there was no business whatever transacted, and the stock exhibited for sale were generally in very poor and wretched condition, doubtless from the unusual severity of the weather. There was a good show of young pigs, and all were picked up early at an average price of 15s. The few pigs purchased were bought at 38s. to 42s. per cwt.—Redcross springers sold at from £11 to £16 each; milch cows from £10 10s. to £15 each; three-year-old cattle were disposed of at prices ranging from £10 10s. to £15 10s., two-year-olds from £8 10s. to £11 10s. each. In the sheep department few sales were effected, mutton selling at from 6½d. to 8d. per lb. Bacon pigs were readily disposed of at from 44s. to 48s. per cwt; bonhams were bought at prices varying from 12s. to 16s. each.—Swords: Springers went from £10 to £17; three-year-olds £15; two-year-olds, from £8 to £12; yearlings, £5 to £7. Mr. Kellett purchased some strippers from £18 to £20 each. P. J. Byrne, J.P., bought 15 cows and bullocks from £13 to £18 each; Mr. Arnold a lot of strippers at £18 each; Mr. Markey a lot of bullocks and heifers at £12 to £15 each; Mr. Davis 20 bullocks and heifers at £7 10s. to £12; Messrs. Long a lot of cows and heifers from £8 10s. to £13 each.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, Monday, March 25.—During the past week the arrivals, both coastwise and by rail, have been moderate; the trade has been good, and prices for best samples from 5s. to 10s. per ton higher. The following are this day's quotations :

Yorkshire Flukes	per ton	120s. to 160s.
,, Regents		110s. to 140s.
Lincolnshire Regents		110s. to 410s.
Dunbar and East Lothian Regents		120s. to 140s.
Perth, Forfar, and Fife Regents ...		110s. to 130s.
,, ,, ,, Rocks.. ...		100s. to 110s.
French Whites		95s. to 100s.

BOROUGH AND SPITALFIELDS.

LONDON, Monday, March 25.—The arrivals of Potatoes, coastwise and by railway, have been seasonably good. Selected parcels move off steadily, at full quotations; but inferior qualities are very dull. Last week's imports were 506 bags from Boulogne; 2,500 from Dunkirk, and 1 package from Bremen.

Yorkshire Regents	105s. to 140s. per ton.
,, Flukes	130s. to 160s. ,,
,, Rocks	100s. to 115s. ,,
Scotch Regents	110s. to 150s. ,,
Foreign	85s. to 95s. ,,

COUNTRY POTATO MARKETS.—Barnsley, (Saturday last.—There was only a moderate supply of potatoes. Rocks 14s., Regent and flukes 15s. per load, retail 1s. 3d. to 1s. 4d. per peck. Doncaster, (Saturday last.)—There was a better show of potatoes, but trade was not so brisk at the opening of the market; but a good clearance was made at the finish. Regents made from 13s. 6d. to 14s. 6d. and 15s. per load. Pontefract, (Saturday last.)—Potatoes 1s. 4d. per wey. York, (Saturday last.) — There was a very small supply of potatoes, and the market was consequently very firm. Round potatoes were 14s. per tub of 280lbs., and 1s. per peck retail; flukes 15s. per tub, and 13d. per peck. The market is about closed for seedlings.

DUNDEE POTATO MARKET.—The market, owing to the severity of the weather for the past ten days, was rather firmer last week, and prices for superior seed samples were quoted at 21s.; the current rates, however, were 19s. to 20s. 6d. per boll of 5 cwt. The retail price continues pretty generally at 1s. 4d. per peck of 28lbs.

ENGLISH BUTTER MARKET.

LONDON Monday, March 25.—With a sudden entrance into Spring weather we have much lower prices for Butter.

Dorset, fine new	132s. to 134s. per cwt.
Middling	110s. to 116s. ,,
Fresh	12s. to 15s. per doz.

CORK BUTTER EXCHANGE, (Saturday last.)—There were 996 firkins weighed out in our market this week, a trifling proportion of which were mild cured. The demand was brisk with advancing prices, and some butter went out of store. Since Monday, thirds rose from 96s. to 99s., and fourths from 68s. to 71s.

AUSTRALIAN WOOL MARKET.—Melbourne, Jan. 26: During the past month twelve auction sales have been held, at which 20,317 bales were catalogued, and about 9,500 bales sold. Quotations were fairly maintained until the arrival of the English mail on the 12th instant, when they became easier, the advices received being somewhat unfavourable. The November sales in London, which it was anticipated would show a decided advance over those of the preceding series of September, were progressing at barely the same rates, the deficient harvest and dulness of trade in the manufacturing districts having prevented that rise in prices which the limited supply naturally led operators to expect. Prospects for February also do not leave much hope for improvement, and this unexpected news has had the effect of depressing the Colonial market to the extent of about 1d. per pound. At this reduction buyers have operated freely, the growers as a rule preferring to realise in the colony rather than incur the uncertainty attending shipment. The Intercolonial show of Wool was held on the 16th instant, and the reports of the judges indicate a steady improvement in the class of exhibits. Most of the samples were beautifully got up, and proved that our breeders are making great progress towards producing a class of wool which will rival, and probably at no distant period surpass, some of the choicest European flocks. On this occasion the pure Australian Merinoes took the highest stand, and although some really splendid samples produced by crossing with imported stock were brought forward. At the auction subsequently held, the lots exhibited realised prices ranging up to 3s. 8½d. per pound, thus fully proving the superior class of wool shown. A new and important feature in connection with the Melbourne market has been the sailing of the ship Isabella Hercus for New York, with a cargo of 1,200 bales of wool purchased here on American account. At present the duties are regulated in accordance with the value per pound, and therefore act almost as a direct prohibition against the importation of the better classes of wool. The shipment in question consists entirely of unwashed sorts, and cannot be accepted as a sample of the really choice descriptions now produced here. The ships cleared for England during the month with wool on board have taken 41,308 bales.—From *Messrs. Goldsbrough's Monthly Circular.*

BRADFORD WOOL MARKET, (Thursday last.)—This morning's market shows very little alteration from last Thursday. There is no improvement in the demand, but spinners continue to buy, as before, just enough and no more to cover any small orders they may have taken. The supply of wool in the market, and especially of bright wools, is not large, and this helps to maintain prices, which are tolerably firm.—*Bradford Observer.*

SALE OF MR. LOGAN'S SHORTHORNS.

This sale took place on Wednesday, March 20, at Maindee, Newport in Monmouthshire, under the direction of Mr. Strafford, when the following were amongst the chief prices made: Golden Duchess (Mr. Eastwood) 120 gs., Cleopatra 5th (Mr. Davies, Mere Hall) 80 gs., Charlotte 4th (Mr. Davies) 90 gs., Minnie Clyde 3rd (Mr. W. Woodward) 52 gs., Jolly Queen (Mr. How, Huntingdon) 110 gs., Queen of Somerton (Mr. Brogdon, Ulverston) 60 gs., Golden Duchess 2nd (Mr. Eastwood) 80 gs., Minnie Clyde 5th (Mr. J. Woodward) 50 gs. The highest priced bull, Royal Buck, went to Mr. Pully for 90 gs., Prince of the Empire (Mr. Gwynne) 80 gs., Golden Duke 2nd (Mr. J. P. Smith, Wick) 60 gs., and Star of Gwent (Mr. W. Butler, Badminton) 56 gs. The 35 cows averaged 45½ gs. each, and the 12 bulls 49 gs. each. The total of the sale was £2,297. The blood was chiefly Booth.

THE SALE OF STOCK OF THE LATE SIR JOHN SHELLEY.—On Wednesday, March 20, Mr. Drawbridge submitted to public competition the fatting and store stock, dairy cows, Southdown sheep, horses, and swine, at Maresfield Park. Sir John had taken a lively personal interest in his farm, and his horned stock and sheep were selected with the greatest care. One of the principal features in the sale was the flock of Southdown sheep. The ewes with and in lamb, of which there were nine lots, ten in each, did not, with one or two exceptions, fetch very high prices. Lot 1, Mr. Balls, 63s. 2, Mr. Mannington, Isfield, 52s. 3, Mr. J. Alchorn, Uckfield, 52s. 4, Mr. D. Aylwin, 52s. 5, Mr. D. Aylwyn, 56s. 6, Mr. Balls. 63s. 7, Mr. Aylwin, 52s. 8, Mr. Aylwin, 50s. 9, Mr. Aylwin, 50s. There were five lots of ten ewe tegs, all of which were purchased by Mr. Colvill, at prices ranging from 40s. to 45s. The competition for wetners was very brisk. Lot 15, ten wether tegs, Mr. Rickman, 41s. 16, twenty do., Mr. Rickman, 40s. 17, do., Mr. Rickman, 40s. 18, Mr. Ellman, 40s. 19, Mr. Ellman, 40s. 20, Mr. Aylwin, 40s. 21, Mr. Saxby, 39s. 22, Mr. Saxby, 36s. The dairy cows included some very choice animals, and in several instances high prices were given. Lot 1, Beauty, Alderney cow, 8 yrs. old, in full profit, to bull 8th Feb., Mr. Gander, of Lindfield, £11 11s. 2, Roseleaf, handsome large shorthorn, 6 yrs. old, in full profit, calved 12th Feb., Mr. Lilley, Rotherfield, £27 6s. 3, Nanny, ditto, 5 yrs. old, to bull 5th Dec., Mr. A. Weston, £24 13s. 6d. 4, Bayleaf, ditto, 6 yrs. old, to bull 12th Dec., to Mr. Childs, £25 4s. 5, Dewdrop, ditto, 7 yrs. old, to bull 19th Jan., to Mr. Kent, £25 14s. 6d. 6, Handsome Ayrshire cow, 3 yrs. old, barren, forward in flesh, to Mr. Balls, £23 2s. 7, Ditto, shorthorn, barren, to Mr. Lilley. £26 5s. Fourteen fatting 3 yrs. old Galloway Scots, in very good condition, some quite fit for the butcher, sold as follows: Mr. Ellis, 1 at £26 15s. 6d., and 2 at £24 3s. Mr. Woodrow three at £24 3s., £23 12s. 6d., and £21 10s. 6d. Mr. Davey, Newtimber, two at £25 14s. 6d. and £24 13s. 6d. Mr. J. Martin, Lewes, two at £23 2s. each. Mr. L. Martin, Ripe, three at £24 13s. 6d., £23 12s. 6d., and £21 10s. 6d.; and Mr. Wood one at £24 3s. The store stock consisted of two-year-old Galloway steers, and were sold in pairs. Mr. Walker purchased three pairs at £28 7s., £27 16s. 6d., and £26 15s. 6d. Mr. Hamshar, one pair at £28 7s. Mr. M. Botting, one pair at £26 15s. 6d. Mr. Stubbs, ditto, £26 15s. 6d. Mr. S. Hillman, a pair, £26 5s. Mr. Pickard, Lewes, a pair £26 5s. There were some exceedingly good horses, which sold well:—Lot 1, Duke, light active Suffolk cart gelding, to Mr. Harding, £29 18s. 6d.; lot 2, handsome mare, eight years old, Diamond, to Mr. Beeney, Hailsham, £28 7s.; lot 3, ditto, five years old, Venture, Mr. D. Aylwin, £22 7s.; lot 4, ditto, four years old, Swallow, to Mr. Balls, £36 15s.; lot 5, fine-shaped, large, powerful chesnut gelding, three years old, Captain, to Mr. Gilbert, £34 13s. 6d.; lot 6, active chesnut mare, nine years old, Smiler, £27 16s. 6d., to Mr. Peckham; lot 7, ditto, 13 years old, Flower, Mr. Smith, £21; lot 8, chesnut gelding, Farmer, £23 12s. 6d.; lot 9, ditto, Sampson, Mr. Balls, £21; lot 10, handsome entire Suffolk horse, eight years old, Hero, £23 14s. 6d.; lot 11, chesnut brood cart mare, 14 years old, with filly foal by side, Darling, to Mr. H. Thomas, £17 6s. 6d.; lot 13, fine-shaped bay cob mare, first-rate hack, Mr. Palmer, £10 10s.; lot 14, promising two-year-old chesnut filly, by Student, Mr. Broad, £15 15s.; lot 15, ditto bay yearling, sister to lot 13, Mr. Avery, £16 16s.; lot 16, ditto, chesnut ditto, by Student, to Mr. Balls, £13 2s. 6d. There were a few lots of swine; the price for breeding sows ranged from £5 15s. to £8; the best boar sold for £5 5s.—*Abridged from the Sussex Express.*

SALE OF KINELLAR SHORTHORNS.—Mr. Campbell had his annual sale of pure-bred Shorthorns at his farm of Kinellar, on Thursday, March 14: the bidding was spirited, and especially for the highest priced animals. The average for the seventeen bulls is £43 5s. 1d., and for the heifers £34 13s. The following are the purchasers' names and the prices obtained: Bulls—Duke of Montrose, red and white, calved 7th August, 1865, by Lord Clyde, sold to Mr. Allan, Bigsley, Dyce, for 30 gs.; Sir Walter, red, calved 23rd January, 1866, by Diphthong III., sold to Mr. A. F. M'Lennan, Meikle Urchany, Nairn, for 85 gs.; Sir Charles, red and white, calved 29th March, 1866, by Diphthong, sold to Mr. James Farquhar, Echt, for 31 gs.; Prince Louis, red, calved 16th March, 1866, by Diphthong III., sold to Mr. Marr, Uppermill, Tarves, for 56 gs.; Byron, roan, calved 18th April, 1866, by Superbus, sold to Mr. Thomson, Dumbreck, Udny, for 39 gs.; The Crown, roan, calved 19th April, 1866, by Diphthong III., sold to Mr. Harris, Earnhill, Forres, for 52 gs.; The Count, roan, calved 20th April, 1866, by Prince of Worcester, sold to Mr. Russell, Kinninmouth, Old Deer, for 52 gs.; Consul, red, calved March 1, 1866, by Prince of Worcester, sold to Mr. Aitken, Achronie, Blackburn, for 38 gs.; Superb, red, calved 12th April, 1866, by Superbus, sold to Mr. Gray, Brownside, Strichen, for 40 gs.; Star, red, calved 21st May, 1866, by Superbus, sold to Mr. Keith, Newton, of Kinmundy, for 46 gs.; Lord Mayor, red, calved May 22, 1866, by Prince of Worcester, sold to Mrs. Walker, Suttie, Fintray, for 41 gs.; Legislator, roan, calved April 30, 1866, by Prince of Worcester, sold to Mr. George Abel, North Ley Lodge, Kintore, for 30 gs.; The Marquis, roan, calved 31st May, 1866, by Prince of Worcester, sold to Mr. Geddes, Orbliston, Fochabers, for 60 gs.; Liberal, roan, calved 30th April, 1866, by Prince of Worcester, sold to Mr. Masson, South Ley Lodge, Kintore, for 21 gs.; Baron Warlaby, roan, calved 15th July, 1866, by Prince of Worcester, sold to Miss Rose Innes, Oldtown, Netherdale, for 30 gs.; Duke, roan, calved 1st June, 1866, by Diphthong III., sold to Mr. Wm. Emslie, Little Banchory, for 16 gs.; Premier, roan, calved Feb. 4, 1866, by Prince of Worcester, sold to Mr. T. G. Rose Innes, of Netherdale, for 36 gs.—Heifers: Leda, red, calved 16th February, 1866, by Diphthong III., sold to Dr. Reid, Ellon, for 27 gs.; Emily, red and white, calved 1st April, 1866, by Diphthong III., sold to Mr. Marr, Uppermill, Tarves, for 54 gs.; Maria, roan, calved 1st March, 1866, by Frederick, Son of Paddy, sold to Mr. Still, Strathrey, Kinellar, for 25 gs.; Rose, red, calved 13th May, 1866, by Diphthong III., sold to Mr. Wishart, Dudwick, Ellon, for 26 guineas.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The month of March has been unfaithful to its antecedents. Wind there has been in plenty; but, instead of scattering gold-dust upon our waiting seed-beds, there have been heavy snowstorms, severe frosts, with sleet and rain in abundance, affording but few opportunities to redeem the sowing-time lost last autumn from overflowing rains. Up to the 23rd, we were without a genial day, and then (according to the recent habit of sudden changes) we plunged into a vernal and almost summer temperature. This is not a good beginning of the season, as the autumn left so much work in arrear; and unless April withholds many of its customary showers, we shall get into May with much land unsown, and of doubtful use. The same cause which hindered autumnal planting—namely, a superabundant moisture—brought about a rapid increase of slugs, each one being a breeder; and so much of the wheat in Herefordshire has been eaten up, that farmers, in despair, have ploughed it in. We, in our last number, adverted to the statistics furnished by the *Mark Lane Express*, proving a deficiency of over 2,000,000 qrs. wheat in our last crop, and requiring therefore as much more than an average import to make it up. Up to the end of February, our receipts in wheat and flour were equal to 3,500,000 quarters, which, as compared with the previous year of comparative plenty, was 1,000,000 quarters short. We have therefore, in the course of the remaining six months of our cereal year, to get together for home necessities about 5,500,000 quarters more. It is a serious question whence is this extra supply to be drawn? Germany has less than usual, with a worse quality. Russia has less, with a finer quality. America has less, with an inferior quality, in consequence of the rains in harvest. And there are only two important sources of supply which alleviate the pressure of this question. Australia has an unlooked-for abundance, perhaps amounting to 500,000 quarters. California may yield a like quantity, but New York offers her more tempting prices; and it will be lucky for us if we get half what she can spare, which amount *in toto*, as an extraordinary source, would be 750,000 quarters; while our monthly requirements, according to the estimate made, will be 900,000 quarters. The tendency of prices, with this prospect, is evidently more upward than towards a decline: indeed, through the month, we have gained 2s. already in value. Without disasters, therefore, to the growing crops, there is a prospect of enhancement; but should reverses happen, our rates would be seriously high, with no extra yield of spring corn or maize to fall back upon, and with our French neighbours short of stock and outbidding us. The following prices were recently quoted at the several places named: Native white wheat at Paris 69s., red 66s.; at Liege red wheat was worth 66s.; high-mixed at Amsterdam 73s.; poor white Zealand at Rotterdam 62s., fine red at Hambro' 63s.; Dantzic varied from 42s. to 63s. (the lower priced being sprouted, and the highest exceedingly scarce); the best red at Stettin was 59s., mixed at Berlin 60s., red at Manheim 62s., at Cologne 60s. 6d., red at Vienna 51s. Spring wheat at Kingston (Canada), only No. 2, or secondary quality, 50s. per qr. (480lbs.); at New York the same was quoted 55s., and white to 80s. per qr.

The first Monday in Mark-lane opened on moderate English supplies of wheat, with a plentiful arrival of foreign, chiefly from the Baltic. The show of samples during the morning was short, especially on the Kentish stands. With some improvement in the condition, more money was at first demanded, but eventually the previous rates were accepted. The demand for foreign was increased, and some descriptions occasionally obtained 1s. per quarter more money, while floating cargoes went off freely at 1s. to 2s. per quarter higher rates. The tone of the country trade this week was decidedly cheerful, and 1s. advance was realized at the following places: Abingdon, Alton, Bridlington, Brigg, Canterbury, Chelmsford, Colchester, Devizes, Birmingham, Newark, Lynn, &c.; while Boston was up 1s. to 2s., as well as Aylesbury and Cambridge; but some places were only firm for the best qualities—this was the case with Hull and Liverpool. At Glasgow no difference of value was noted, but Edinburgh was up 1s. per quarter. The only change at Dublin consisted in a better sale of foreign qualities.

The second Monday had a moderate quantity of home-grown wheat, with very scanty arrivals from abroad. Not many fresh samples were exhibited in the course of the morning on the Essex and Kentish stands, and, with the condition further improved, factors were enabled to realize an advance of 1s. per quarter on all good qualities, but the sale was by no means brisk. Fine Russian and Dantzic wheats were held on rather higher terms, but there was no general improvment in prices. Floating cargoes further improved 1s. per quarter, the number left on hand being but moderate. The London advance of 1s. was generally well maintained in the country, as at Hull, Leeds, Birmingham, Wakefield, Manchester, Gainsborough, Spalding, Wolverhampton, Rochester, Bury St. Edmunds, and most of those held on Saturday; while some towns, as Ipswich, wrote the improvement at 2s.; Liverpool advanced 2d. to 3d. per cental on the week. Glasgow was up 1s., but Edinburgh reports were dull. The business in wheat at Dublin was moderate, at rather improved rates.

On the third Monday there was a small English supply, with only moderate arrivals from abroad. The fresh samples exhibited on the Kentish and Essex stands were not numerous. Early in the morning, supported by some country advices, factors were generally requiring 2s. advance on the previous rates; but this checked business, which was only practicable at an improvement of 1s. per quarter. In foreign the advance was limited to find Saxonska and old Rostock wheat, Dantzic and other qualities not making any more money. The upward movement in floating cargoes continued, and 1s. over the previous rates was freely paid. The country markets during this week generally followed London—Boston, Hull, Rochester, Lynn, Wolverhampton, Dorchester, and most of those held on Saturday, being 1s. higher; while Birmingham, Dunstable, and Bury St. Edmunds were up 1s. 6d. per quarter; Wolverton and a few other places noted a rise of 2s. per quarter. Some towns were, however, only firm, as Frome, Manchester, and Liverpool. Scotland generally was firm, and Glasgow noted an improvement of 1s. per quarter. Irish markets were also under the same influence, but without much activity.

The fourth Monday had moderate English and foreign supplies. The show of samples from Essex and Kent was very scanty; but the sudden change to mild weather from Saturday gave different views to buyers, who held aloof, and would only buy sparingly at the previous Monday's rates. The foreign trade was very limited, and prices scarcely maintained the previous currency, and there was quite a stop to the sale of floating cargoes, which up till then had been in active request and rising.

The imports into London for the four weeks were 19,262 qrs. English, 55,187 qrs. foreign, against 30,780 qrs. English, 31,922 qrs. foreign, for the same time in 1866. The general averages commenced at 59s. 11d. and closed at 59s. 4d. per qr. Those of London began at 64s. and finished at 62s. 8d., showing a moderate decline. There were no exports through the month. The imports into the kingdom for four weeks up to the 16th of March were 1,920,142 cwt. wheat 314,051 cwt. flour.

The flour trade has scarcely varied as regards quotations through the month; but the greater or less facility of sales has always been in keeping with the state of the wheat market. There was therefore more firmness for the first three Mondays in country and foreign sorts; but on the fourth Monday buyers seemed to hold quite aloof for fear of lower rates. Town rates have all along ruled at 57s. for the best qualities. Almost nothing has been received from America, and though occasionally the Paris market has been depressed enough to attract English orders, our imports from France have been insignificant. The London receipt for the four weeks were 76,965 sacks English, 9,401 sacks 37 brls, foreign, against 81,158 sacks English, 7,877 sacks 3,075 brls. for the same time in 1866.

The arrivals of barley during the month have been scanty, and yet malting sorts, as well as medium qualities, have gone down about 2s. per qr. The fact that so much sugar is used in the manufacture of beer has made the deficiency of the barley crop a much lighter matter than it would otherwise have been. Some, overlooking it, were of opinion that fine malting qualities would reach as high as 63s.; but these ideas have been proved to be extravagant, and without a reduction of the malt-duty, barley-growing may soon turn out unprofitable. The partial failure of the maize crop in the United States has kept up the value of grinding sorts beyond their natural level, and the smallness of stocks on hand here and abroad will probably keep them comparatively dear to the close of the season; but malting sorts, should any be left, will soon be out of date. The imports into London for four weeks have been 7,424 qrs. British, 38,371 qrs. foreign, against 16,926 qrs. British, 23,810 qrs. foreign in 1866.

The oat trade has undergone several fluctuations. As soon as fair instalments of the expected Swedish supplies came to hand a depression was felt, as though immense arrivals were soon to follow. This state of things continued for the first fortnight, when oats lost value 1s. to 1s. 6d. per qr.; but when it was seen that an export demand for France had sprung up, and the expected arrivals were not forthcoming, a reaction suddenly took place, and the last two markets fully recovered the decline of the first fortnight, leaving prices rather higher than they commenced. With stocks short, and a good demand for the country, the crop being deficient, though rates for this grain are comparatively high, we must expect to see fluctuations to the close of the season, dependent on the foreign supplies, which we do not think promise to be over abundant. The imports into London for the four weeks have been 6,898 qrs. English, 203 qrs. Scotch, 3,460 qrs. Irish, 124,174 qrs. foreign, against 6,248 qrs. English, 812 qrs. Scotch, 4,850 qrs. Irish, 147,296 qrs. foreign for the same period in 1866.

With but moderate supplies of English beans, very cold weather, and almost nothing from abroad, this trade has been on a limited scale, and prices have scarcely been supported for new English qualities. But as stocks are low and free imports next to impossible, we do not expect much reduction, but incline to the opinion of some improvement. The imports for four weeks were 4,189 qrs. English, 25 qrs. foreign, against 3,876 qrs. English, 780 qrs. foreign in 1866.

The pea trade has been in a quiet state, with supplies very moderate, and exclusively homegrown. It would appear that this crop, which has been considered perhaps the best of last year's, has been extensively used by farmers for feeding purposes at home, and so but few have reached the London market, where the sale has been neither brisk nor advantageous. The imports into London in four weeks were only 1,478 qrs., against 1,626 qrs. English, 610 qrs. foreign in 1866.

With very small supplies of linseed through the month, this seed has improved in value 1s. to 2s. per qr. Cakes were in good demand till the mild weather came, when they fell off.

The cloverseed trade, in consequence of the rough and wet weather, has been unusually limited, and the want of a demand in France has brought constantly declining prices at Paris. Tares have also been of irregular value, the supply being beyond the demand. Canary has ruled very dull, and also other seeds.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white... old 61 72...new	54 to	67
,, ,, ,, red ...... ,, 61 68... ,,	54	64
Norfolk, Lincoln, and Yorkshire, red..................	51	64
BARLEY ....31 to 34..........Chevalier, new	38	50
Grinding..............30 32.........Distilling	37	42
MALT, Essex, Norfolk, and Suffolk ....new	69	73
Kingston, Ware, and town-made .... ,,	69	73
Brown .... ,,	54	62
RYE..	32	37
OATS, English, feed 24 to 30..............Potato...........	27	33
Scotch, feed ....22 29..............Potato...........	27	33
Irish, feed, white 21 25..............Fine.............	26	29
Ditto, black ....21 25..............Potato...........	26	30
BEANS, Mazagan ...35 38..............Ticks............	35	38
Harrow ....38 43..............Pigeon	42	46
PEAS, white, boilers..39 40 Maple 39 to 40 Grey, new	36	37
FLOUR, per sack of 280lbs., Town, Households........	51	57
Country, on shore ....44 to 46 ,, ...	47	50
Norfolk and Suffolk, on shore	43	45

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Dantzic, mixed ......60 to 63........old, extra	64 to	71
Königsberg ....59 63.........extra.....	64	66
Rostock ....56 65.........fine	64	67
Silesian, red.....................55 60.........white	60	64
Pomera., Meckberg., and Uckermrk. ...red old...	58	63
Russian, hard, 52 to 58...St. Petersburg and Riga	55	61
Danish and Holstein, red	56	59
French, none...............Rhine and Belgium.........	58	63
American, white 00, red winter 00 to 00, spring	00	00
BARLEY, grinding 29 to 31....distilling and malting	33	38
OATS, Dutch, brewing and Polands 23 to 30.......feed	20	25
Danish and Swedish, feed 23 to 29.... Stralsund...	22	27
Canada 22 to 25, Riga 24 to 26, Arch. 23 to 26, P'sbg.	24	27
TARES, Spring, per qr. ...... small 38 ...... large ...	40	42
BEANS, Friesland and Holstein	38	42
Königsberg................40 to 42...Egyptian	39	40
PEAS, feeding and maple...36 38...fine boilers	37	39
INDIAN CORN, white......36 39...yellow	35	38
FLOUR, per sack, French..44 52...Spanish, p. sack	46	52
American, per brl.......26 30...extra and d'ble.	30	32

PRICES OF SEEDS.

LONDON, Monday, March 25.—The severe and wintry weather of the past week has rather alarmed the holders of foreign Cloverseed, and some of them being anxious to be out of stock have taken less money for red qualities. The demand to-day was moderate, and prices were somewhat irregular, but in favour of buyers. White Cloverseed was steady in value. Trefoil remains unaltered, with a limited demand. Nothing passing in Mustardseed to change the price of either brown or white qualities. Foreign spring Tares were forcingly offered again, and prices were both low and irregular. Scotch : Large quantities are placed slowly at prices ranging from 52s. up to 60s. per qr. The weather this season has been sadly against all agricultural seeds, and does not take up kindly.

BRITISH SEEDS.

Mustard, per bush., brown 15s. to 17s. white	10s. to	15s.
Canary, per qr..	52s.	62s.
Cloverseed, red..	54s.	72s.
Coriander, per cwt..	18s.	20s.
Tares, winter, new, per bushel	5s. 0d.	5s. 6d.
Trefoil..	22s.	25s.
Ryegrass, per qr.	20s.	22s.
Linseed, per qr., sowing 68s. to 72s., crushing	63s.	66s.
Rapeseed, per qr...	56s.	62s.
Linseed Cakes, per ton....................	£11 10s. to	£11 5s.
Rape Cake, per ton............................	£5 5s. to	£5 10s.

FOREIGN SEEDS.

Coriander, per cwt..	18s. to	20s.
Cloverseed, red 52s. to 68s., white..............	86s.	104s.
Trefoil..	18s.	20s.
Ryegrass, per qr.	18s.	20s.
Hempseed, small 38s. per qr., Dutch............	40s.	42s.
Linseed, per qr., Baltic 63s. to 64s...Bombay	67s.	68s.
Linseed Cakes, per ton.	£11 0s. to	£12 5s.
Rape Cake, per ton..............................	£5 5s. to	£5 10s.
Rapeseed, Dutch..	58s.	60s.
Carraway ,, ...	42s.	44s.

IMPERIAL AVERAGES

For the week ended March 16, 1867.

Wheat	57,584⅛ qrs.	59s.	4d.
Barley	29,200 ,,	41s.	5d.
Oats	8,741⅞ ,,	24s.	9d.

COMPARATIVE AVERAGES.

	WHEAT.			BARLEY.			OATS.		
Years.	Qrs.	s.	d.	Qrs.	s.	d.	Qrs.	s.	d.
1863...	48,233⅞ ...	45	3	39,830¾ ...	36	7	12,587¾ ...	21	4
1864...	77,432⅛ ...	40	1	45,177¾ ...	31	5	13,297½ ...	19	8
1865...	70,688¾ ...	38	3	41,679⅝ ...	28	10	7,614⅝ ...	21	4
1866...	72,446¼ ...	45	6	40,180½ ...	35	10	8,372 ...	23	10
1867...	57,584⅛ ...	59	4	29,200⅞ ...	41	5	8,741⅞ ...	24	9

AVERAGES

For the last Six Weeks:	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
Feb. 9, 1867..................	61	4	45	3	24	9
Feb. 16, 1867..................	59	10	43	9	23	6
Feb. 23, 1867..................	59	11	43	4	24	3
March 2, 1867..................	59	8	42	4	24	8
March 9, 1867..................	59	3	41	5	24	1
March 16, 1867..................	59	4	41	5	24	9
Aggregate Average	59	11	42	11	24	4
Averages last year	45	6	35	10	23	10

HOP MARKETS.

Mid and East Kent	£8	10	£9	9	£11	11
Farnham and Country	8	10	9	9	11	5
Weald of Kent	8	8	8	15	9	5
Sussex..............................	8	4	8	8	8	15
Yearlings	5	5	6	6	7	10
Olds.................................	2	16	3	15	4	15

ENGLISH WOOL MARKETS.

CITY, Monday, March 25.—Since our last report, the demand for all kinds of English wool has been very inactive, owing, in a great measure, to the attention of the trade being absorbed by the public sales of Colonial still in progress. Compared with the previous week, however, no quotable change has taken place in prices.

Current Prices of English Wool.		s.	d.		s.	d.
Fleeces—Southdown hoggets............	per lb.	1	6½	to	1	7½
Half-bred ditto	,,	1	8½		1	9½
Kent fleeces..........................	,,	1	7		1	8
Southdown ewes and wethers	,,	1	6		1	7
Leicester ditto	,,	1	6		1	8
Sorts—Clothing	,,	1	[illegible]		1	9½
Combing	,,	1	5½		1	11

LEEDS (English and Foreign) WOOL MARKETS, (Friday last.)—There is no change of importance either in the price or demand for English wool. The consumption of it, as compared with the same period of last year, is lessened, and no one seems inclined to purchase beyond present requirements. There is no active demand for Colonial and other clothing, but the fact that there is still a brisk competition for some sorts at the London sales, tends to keep up confidence in this market.

GLASGOW WOOL MARKET, (Saturday last.)—Our wool market during the week has not undergone any appreciable change. The severe weather we have at present has a tendency to restrict business, consequently transactions are limited. A moderate amount of business has been done in Cheviot wools, but other classes are not in demand.—*F. H. M'Leod.*

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano direct from the importers stores, £12 5s. to £12 10s. per ton.
Bones, £6 to £6 5s. Ditto Crushed, £6 10s. per ton.
Animal Charcoal (70 per cent. Phosphate) £5 per ton.
Coprolite, Cambridge, whole £2 10s., ground £3 to £3 2s. 6d. per ton.
Suffolk, whole £2 to £2 10s., ground £2 10s.
Nitrate of Soda, £12 5s. to £12 10s. per ton.
Gypsum, £1 10s. Superphosphates of Lime, £5 5s. to £6 5s. per ton.
Sulphuric Acid, concentrated 1·845 1d. per lb., brown 1·712 0¾d.
Blood Manure, £6 5s. to £7 10s. Dissolved Bones, £6 15s. per ton.
Linseed Cakes, best American brl. £12 to £13, bag £11 to £12 10s.
Cotton Seed Cake, £6 15s. to £7 10s. per ton.

E. Purser, London Manure Company,
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Brimstone, 2d&3rd	0 0 0	0 0 0	Cotsd. Cake, decort.	0 0 0	0 0 0
Saltpetre, Bengal,			Linsd. Bomby, p. qr.	3 9 0	3 10 0
2 per cent.	0 0 0	0 0 0	Rapeseed, Guzerat	0 0 0	0 0 0
Nitr. of Soda, p. ct.	0 11 9	0 12 3	Niger....................	1 12 0	1 13 0
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8 lb.	40	,,	,, ,, ...	0	4	0
10 lb.	50	,,	,, ,, ...	0	5	0
20 lb.	100	,,	,, (cask and measure	0	10	0
30 lb.	150	,,	,, included)	0	15	0
40 lb.	200	,,	,, ,, ...	1	0	0
50 lb.	250	,,	,, ,, ...	1	3	6
60 lb.	300	,,	,, ,, ...	1	7	6
80 lb.	400	,,	,, ,, ...	1	17	6
100 lb.	500	,,	,, ,, ...	2	5	0

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"For JOHN TINGEY, Esq.,
"R. RENNEY.

"To Mr. Thomas Bigg."

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THE FARMER'S MAGAZINE,

AND

MONTHLY JOURNAL

OF

THE AGRICULTURAL INTEREST.

Dedicated

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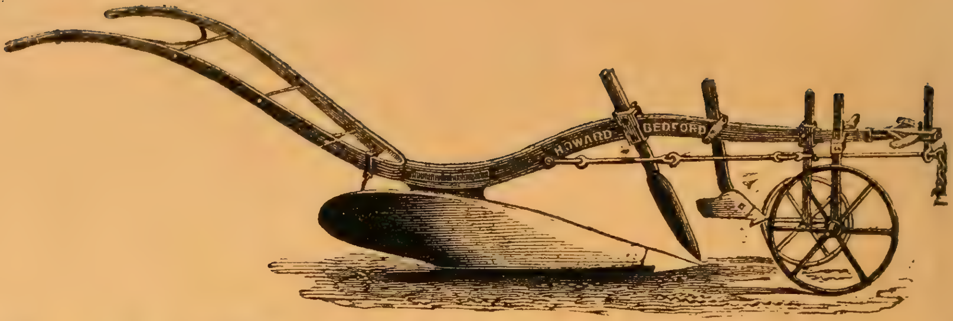

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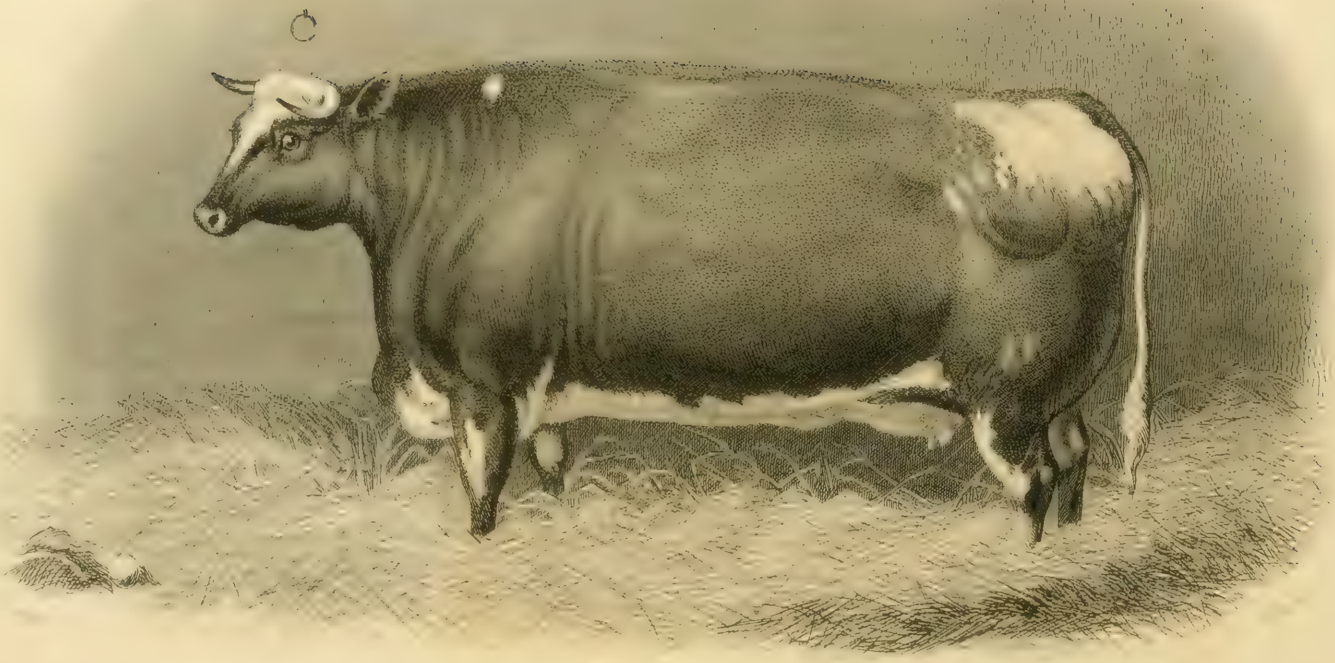

Durham

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The First Class

[illegible]

THE FARMER'S MAGAZINE.

MAY, 1867.

PLATE I.

DIADEM: A PRIZE SHORTHORN COW.

THE PROPERTY OF MR. RICHARD STRATTON, OF WALL'S COURT, BRISTOL.

Diadem, a roan, calved on January 13th, 1862, and bred by Mr. Stratton at Broad Hinton, is by Warwick (19120), out of Lotus by Buckingham (15700), her dam Cherry Ripe by Nottingham (15014), — Buttercup by The Red Duke (8694), — Rosamond by Hero of the West (8150), — Young Moss Rose by Lottery (4280), — Phœnix (6290).

Warwick, a red roan, bred by Mr. Stratton, and calved November 15th, 1859, is by Nottingham (15014), out of Matchless 4th by Waterloo (11025), her dam Matchless 2nd by the Red Duke (8694), — Moss Rose by Phœnix (6290).

Lotus, a roan, was bred by Mr. Stratton, and calved on June 26th, 1859, Diadem being her first calf.

In 1863, as a yearling, Diadem took the first prizes in her class at the Badminton and at the Chippenham Shows.

In 1864 Diadem was the best two-year-old Shorthorn heifer at the Bristol Meeting of the Bath and West of England Society; the third prize in her class at the Newcastle-upon-Tyne meeting of the Royal Agricultural Society; and first again at Badminton and at Chippenham.

In 1865 Diadem showed, under some disadvantage, as a cow being only turned three years old. She was, however, the best in a generally-commended class of Shorthorn cows, at the Hereford meeting of the Bath and West of England Society; and second to Mr. Wood's Corinne, at the Plymouth meeting of the Royal Agricultural Society. She was then getting very full of flesh, but was first again at Badminton and at Chippenham.

Diadem's produce consists of two bulls, both by Lamp of Lothian, and both retained for home use. The elder, Light, is the sire of about thirty calves, four-fifths of which are bulls, so that from such a lot a few steers may be culled. The other, Coronet, calved in October, 1865, is at Broad Hinton. Diadem has not bred since; and her career, consequently, closed at the last Smithfield Club Show, where she took the first prize of her class, and the Silver Cup of £40 as the best heifer or cow in any of the classes; Mr. Lynn's Pride, Messrs. Howard's Claret, Mr. Stratton's Garland, and the Lord Feversham's Princess being amongst her competitors for the final honours.

We had often spoken to Diadem's merits, in seeing her about, as "a fine lengthy cow, with a good head and nice character."

PLATE II.

THE FIRST CLASS.

With the cattle again scratched, while—

> "The Shorthorn o'er his fate must brood,
> The weary Devon loathes his food,
> The Whiteface tires of his stall,"

the horse will once more be the *Hamlet* of the Summer Shows, as, in fact, every preparation is being made for even a better display than usual in this way. So thoroughly established, indeed, have these meetings become, that we are inclined to renew a suggestion which we made a few years back as to the Government offering some official recognition of such occasions. If the breed of horses in times gone by could ever have been improved by the annual gift of a certain number of Royal Plates, we feel very confident that the same object might now be more directly encouraged by the grant of a few Royal Hundreds, to be competed for on the show-ground rather than the race-course. Just the very sort of horse we want—the hunter, the charger, and the hack—would be developed more systematically by these means, as the uses of such an incentive might be gradually extended to the breeds of carriage and heavy draught-horses. The Emperor of the French—a wise man in his generation—has for a considerable period been pursuing something of this plan, and, as we all know, nothing is more marked than the advancement of late years, in the fashion and character of the French horse. In this country, however, private enterprize supplies very much the place of Government patronage, and the Horse Show, strong as it has become, has been left pretty much to take care of itself. Still, as a speculation it pays, and at Islington and Birmingham these exhibitions will be continued mainly, if not entirely, as remunerative undertakings. The Directors of the Agricultural Hall have issued a very attractive prize-sheet, opening with the highest prize ever yet offered for a hunter—viz., one hundred guineas, although as much has been given at the Royal Meetings, and, as the example at the little Cleveland Show, for a thorough-bred stallion. Although the entries do not close until Saturday, May 15th, we hear that this offer is already being responded to, and that amongst others Mr. Anstruther Thomson will have even a better horse than Rainbow up. We assume this gentleman must be "the very celebrated Master of Hounds" who has addressed a letter to Mr. Clayden, the Chairman of the Directors, on "the irregular proceedings" which took place on the interim Sunday of the last show, and expressing every confidence that "your resolution will prevent anything of the kind occurring again." The Board, indeed, has issued the following wholesome orders to its secretary, so that the Sunday dealing and trying, however proper in Paris, will not be again permitted in London: "No visitor will be admitted to the Hall on Sunday, and no horse will be allowed to be removed from his stall on that day on any account, except in case of serious illness." Some of the other rules and regulations are amusing enough, such as: "Servants are expected to be neatly dressed during the hours of exhibition, in hats; and in boots and breeches, if possible. They will not be allowed to come into the ring in caps or stable dresses." This is rather a funny way of putting; while we really do not see that a man who looks after a stallion, for instance, should be in boots and breeches, if possible. This proviso, *if possible*, reminds one of the old school of dandy, who gradually forced himself into his pantaloons across the banisters, and who, in ordering his breeches to fit tight, swore he would not have them if he could ever get them on! Another of the conditions is very open to objection: "No horse can take a First Prize in the same class in two following years." Why not? This is in mere imitation of the Royal Agricultural Society's similar rule; but there is little or no reason for such a clause. On the contrary, it might be serviceable to see how such a horse as Voyageur, for example, who was afterwards thoroughly beaten at York, could hold his own again at Islington. Then there is to be jumping over gates stuffed with gorse, if the Judges order it, or the exhibitors afterwards wish their horses to be so proved; and on the last day jumping matches and trotting races, "for horses which leap artificial fences in the best style," and for "the fastest trotter in single harness." A trotting match we take to be quite out of character with such exhibitions, or if not, surely a steeple-chase, after the manner of the Circus, might be provided, to be ridden by real jockeys, in boots and breeches, *if possible.*

At the Birmingham Show which follows in June, a companion show of fox-hounds is arranged for, although we can scarcely understand how the limited accommodation of Bingley Hall can be made to accomplish so much. However, it is promised that Stewards who do know something of such a business will be this year on duty, so that "the irregular proceedings," as the M. F. H. calls it, will not be suffered here either. The Bath and West of England meeting at Salisbury is unfortunately fixed for the same week, or rather the Birmingham authorities went into opposition with their eyes open; and the Royal Meeting at Bury St. Edmunds follows about the middle of July, with the only £100 we now have for a thorough-bred stallion. But the best horse-show of the year comes early in August, when the Yorkshire Society holds its meeting at Northallerton, where the Islington manager might very profitably add to his experience of the Paris, Dublin, and Birmingham horse shows. Only fancy the famous Mr. Tom Parrington, who has done more for the proper conduct of such exhibitions than any other man in the world, being quite left out of it! We would really suggest, if only in the way of a little mutual advantage, that the Yorkshire Council put Mr. John Clayden, the chairman of the Agricultural Hall, into office as a judge of cart-horses at Northallerton.

OUR ROADS.

BY CUTHBERT W. JOHNSON, F.R.S.

The state of the roads commonly indicates the character of the natives of a country. The traveller in foreign lands speedily makes this discovery. He notices, for instance, the excellent roads of France and England, and finds a corresponding energy and activity in the inhabitants. In other lands, as in Spain, he encounters either miserable roads, or in whole districts no appearance of ways that can be called such. In the Peninsula, indeed, it is necessary, it seems, to have the carriages of the wayfarers attended by footmen, who are furnished with poles, to extricate them from sloughs, or to raise them when upset. This, indeed, was an essential precaution in England long after the time of the Stuarts. Even as late as the year 1703, when Prince George of Denmark went from

Windsor to Petworth, to meet Charles III. of Spain (the distance being about forty miles), he required fourteen hours for the journey, the last nine occupying *six* hours. The writer who records this fact says that the long time was the more surprising, as, *except when overturned*, or *when stuck fast in the mire*, his Royal Highness made no stop during the journey. Forty years after this time, viz. 1742, the roads could not have been much improved, since the Oxford and London stage-coach then occupied nearly three days on the journey. It was only, in fact, the high roads that were then passable for light carriages at all seasons of the year. In even the early part of the reign of George III. it was well known that the owner of Hartland Abbey, in North Devon, when he travelled from his country seat to London, slowly progressed by very short journeys a day. He was dragged along in his carriage by a strong team of Devon bullocks, attended by his tenantry, partly on foot, partly on horseback, who assisted when the carriage got into a difficulty. They managed in a summer's day to get, by steady perseverance, from Hartland to Bideford (some 16 miles), proceeding the next morning in the same tediously slow way towards the Metropolis.

This neglect of the roads is quite unaccountable: neither the Parliament nor the Government of those days earnestly attempting their improvement. It was not indeed till the reign of Henry VIII. that, in 1524, Parliament first took notice of the repair of the public highways. Turnpikes were not erected till 1663 (15 Charles I., c. 1), by an act entitled, "An act for repairing the highways within the counties of Hertford, Cambridge, and Huntingdon, the highway from London to York, and Scotland, &c.;" and the first serious attempt at the improvement of our roads by M'Adam was not made until about the year 1818. This tardy attention to the state of the roads must be attributed to the simplicity and rude state of society of the time. The discomfort and loss of animal power in drawing carriages over such ways was in those times never seriously regarded. These facts, however, sooner or later, as civilization advances, begin to be considered with the needful attention. When this became the case in England, men of science directed their attention to the amount of animal labour required to draw a given weight over roads formed of different materials and in various states of repair. And then as a natural consequence, the nature of the materials employed and the best shape of the roads became important matters for inquiry. It is these practical studies which are deeply interesting to a large class of readers of this journal. I propose, then, to collect in this paper some of the chief facts bearing upon the repair of our roads. First, then, as to the animal power expended on a highway. That the state of a road has a very material influence upon the animal power required, every person is well aware, but few persons regard the difference between the labour of drawing a carriage over a road in good condition and the same road when out of order. This has been, however, experimentally determined. In these trials it was found that a light carriage with four wheels, weighing with its load 1,000lbs., required a force of traction as follows (*Farmers' Almanack*, vol. i., p. 61):

On a turnpike road, when hard and dry ...	30½ lbs.
On the same road when dirty	39 "
On a hard compact loam	53 "
On an ordinary bye-road	106 "
On a turnpike road, newly gravelled	143 "
On a loose sandy road	204 "

The care with which all drivers avoid the newly gravelled portions of a road is well known, yet few of even the best whips are aware of the enormous difference of pressure upon the collar shown by the above table to exist, when the load is passing over a hard and dry turnpike road, and the same road when newly gravelled, or composed of loose sandy materials.

Sir J. Macneil directed his experiments to the same question—viz., the relative value of the different description of roads as generally used in this country, or, in other words, the amount of resistance offered to the movement of loads over them. He found that this amounted on stone pavement to 1-68th of the gross load; broken stone on firm foundation, 1-49th ditto; broken stone on foundation of flints, 1-34th ditto; gravel road, 1-15th ditto; soft sandy and gravelly ground, 1-7th ditto.

But it is not only of importance that the best material should be selected for making the road, but how its state of cleanliness very materially influences the amount of animal power expended should be more generally understood. In a recent able report to the Local Government Commissioners and Board of Health of Croydon upon the construction and repair of their roads by Mr. Baldwin Latham, their engineer and surveyor, he thus remarks upon this branch of our inquiry:—

"It is a most important matter that all roads should be kept as clean as possible, as the accumulations of mud or dust are extremely destructive to the road, and, moreover, greatly increase the amount of force necessary to overcome friction, which increases greatly with the dirty condition of a road, as may be seen from the following table by M. Morin, which gives the proportion of the weight required to draw a given weight over a road in different states of repair:

BROKEN STONE ROADS.	CHARACTER OF VEHICLE.			
	Carts.	Trucks, 2½ tons.	Carriages with seats, bearing on springs.	
			Trot.	Walk.
Very dry and smooth	1-75th	1-54th	1-42nd	1-49th
Moist or dusty.........	1-53rd	1-38th	1-27th	1-34th
With ruts and mud...	1-33rd	1-24th	1-22nd	1-19th
Deep ruts and thick mud	1-19th	1-14th	1-10th	1-12th
PAVED ROADS.				
Dry	1-90th	1-65th	1-59th	1-39th
Muddy	1-69th	1-50th	1-55th	1-34th

The second important branch of the inquiry is the durable quality of the materials to be employed. On this great question Mr. B. Latham (p. 15) arrives at the conclusion that of the granites "the darkest-coloured will be found to be the best; and experience has long established this fact—that, of those used for road purposes, there is none of greater value than the dark granite procured from Guernsey.

"So far as experiments have been made in Croydon, it appears that granite is nearly three times as durable as broken flints under the same circumstances; but, as its cost is only twice that of flint, it follows that granite is the cheaper material for the repair of all roads of great traffic. This seems now to be such a well-established fact, that, year by year, as the traffic has increased in the suburban districts of London, the local materials have been superseded by Guernsey granite.

"Although granite by the length of time it wears has shown itself to be the cheapest road material that can be used, yet the saving in cost of material is not the only saving. It may be laid down as a rule, that the amount of material put on a road for repair represents the mud and dust that has been swept up and carted away; so that, by the use of a better material, you will not only save in the cost of the material (from its being more durable and less expensive to repair), but you will save directly by not having so much mud and dust to sweep up and cart away.

"Different descriptions of granite have been tried in Croydon, but principally those imported from Hudson's Bay, Port Phillip, and Bombay; but they are not to be recommended, as there is a great difference in their quality; and, since they have been used for ballast on board ship, and not selected with the care and judgment required for ensuring a uniform quality, they are naturally inferior to granitic stones selected for this specific purpose.

"*Greenstone* is a term applied to those trap rocks that are composed of felspar, augite, and hornblende. It differs from syenite from the preponderance of hornblende over felspar, and the consequent smaller proportion of potash, which is a great agent for the destruction of all siliceous stones; and as, in the case of granite stones, the preponderance of hornblende is the test of the value of those stones for the purposes of road-making, it follows, as a natural consequence, that greenstone will be superior even to granite as a material for the construction and repair of roads. It has also another advantage over some granites, which is, that, while it forms a hard smooth surface, it never wears so as to be slippery.

"This material is procured in large quantities from Penmaenmawr, in Carnarvonshire, and can be delivered at London at about the same price as granite. The following valuable statement from Dr. Fairbairn's *Useful Information for Engineers*, showing at a glance the nature and quality of this stone, gives the crushing stress in pounds per square inch—or, in other words, the weight required to crush a square inch of different materials: Penmaenmawr stone 16893, basalt (whinstone) 11970, Mount Sorrel granite 12861, Argyleshire ditto 10917, Mount Sorrel syenite 11820, strong Yorkshire sandstone (mean of nine experiments) 9824, strong compact limestone 8528, magnesia limestone 7098, weak ditto 3050.

"The superiority of Penmaenmawr stone to resist the crushing action of the wheels of vehicles is fully demonstrated by the foregoing table, and this, combined with its other advantages, make it a stone well adapted for use in repairing roads. Indeed, this stone and Guernsey granite are, in my opinion, the best description of stone that can be used for the repair of the roads. The cost of the Penmaenmawr stone at the quarries is 2s. per ton unbroken, or 4s. per ton broken."

The practical experience of Mr. Latham upon the formation of roads will be interesting to the reader. As he remarks, every good road should be hard, smooth, and durable; and in order to ensure this condition, the materials used in their construction should also be hard, tough, and durable, and moreover should possess the property of quickly uniting in one compact mass. But even the best material, unless properly broken, injudiciously applied, and constantly attended to, will not make a good road. There is no class of work, let it be remembered, that needs greater attention at the hand of the labourer, than is required in road making and maintaining; and yet, as a rule, this class of work is generally left to the very worst class of labourers.

There are three systems of road making in this country: the ordinary system of gravel roads; the Macadam system; and the Telford system. The system of making roads with gravel and rounded stones, as was formerly universally practised, is, at the present day, admitted on all hands to be radically wrong and unscientific; as it is impossible for any number of rounded pebbles ever to bind together to form a firm and compact road; and when, in course of time, a tolerably even surface is produced, it is caused by the grinding down of the materials and the disintegrated portion filling up the interstices between the pebbles; roads of this description become a mass of sand and pebbles, and being entirely absorbent, the effect, either of drought or wet, is to loosen the fictitious binding, and the roads break up under the traffic.

The Macadam system of road making consists in making the road of stone, all the stone of which are to be broken in an angular form; when, owing to the angularity, they soon fix themselves and form a firm and even road, without destruction of the materials. In roads made under the Macadam system no foundation is prepared; but the material is put directly on the earth which is formed to receive it; this, in many cases, is found to make an elastic road, which is prejudicial, as requiring greater tractive force to move a load over it.

The Telford system of road making is the one now universally adopted, for, while it possesses all the merits of the Macadam system, it has not its defects. Under the Telford system, a solid foundation is prepared, which may be termed the sub-road; and, in this case, the office of angular stones that are used to form the surface of the road is, really, to protect the actual road or sub-road from being injured by the feet of horses and vehicles or by the weather.

In all cases in your district where an alteration of a roadway may be thought desirable, or in cases where new roads may be constructed, I should advise that the Telford system of road-making be adopted. A point of equal importance to the selection of the materials and the mode of application is that of the best cross section for the roads.

One of the greatest mistakes committed in road-making is the constant heaping on of materials in the centre of the road, until they have become quite rounded and considerably higher in the centre than they are at the sides. It must be admitted that, in order to secure efficient drainage of the surface of the road, it is requisite that the centre should be somewhat higher than the sides; but the amount of elevation actually required for the purposes of securing efficient drainage is much less than is generally supposed; and the object should be so to perfect the means of drainage as to do with the least possible elevation. Apart from the question of drainage theoretically, the best road and the one least liable to wear and tear would be a flat one with a level cross section, as on all roads that are rounded there is but one portion in which vehicles can stand upright, and that is the centre of the road—consequently a greater amount of wear and tear takes place than when the road is flatter, and vehicles can traverse it in all directions. In a very convex road, when a vehicle is not travelling in the centre, the load is unequally disposed and the vehicle has a constant tendency to slide down the inclined plane, which tendency promotes the rapid destruction of the road. The evidence of Macadam on this point, as given before a committee of the House of Commons in 1819, is very conclusive:—

"I consider," he remarked, "that a road should be as flat as possible with regard to allowing the water to run off at all, because a carriage ought to stand upright in travelling, as much as possible. I have generally made roads three inches higher in the centre than I have at the sides, when they are 18ft. wide; if a road be smooth and well made the water will run off easily on such a slope." And he further observed, in reply to this question: "Do you consider a road so made will not be likely to wear hollow in the middle, so as to allow the water to stand, after it has been used some time?" "No; when a road is flat people will not follow the middle of it as they do when it is made extremely convex. Gentlemen will have observed that in roads very convex travellers generally follow the track in the middle, which is the only place where a carriage can run upright; by which means three furrows are made by the horses and wheels, and water continually stands there; and I think that more water actually stands upon a very convex road than on one which is reasonably flat."

Mr. Walker (another great authority on such questions), when giving evidence before the same committee, said, "A road much rounded is dangerous, particularly if the cross section approaches towards the segment of a circle, the slope in that case not being uniform, but increasing rapidly from the nature of the curve as we depart from the middle or vertical line. The over-rounding of roads is also injurious to them, by either confining the heavy carriages to one track on the crown of the road, or, if they go upon the sides, by the greater wear they produce from their constant tendency to move down the inclined plane, owing to the angle which the surface of the road and the line of gravity of the load form with each other; and, as this tendency is perpendicular to the line of draught, the labour of the horse and the wear of the carriage wheels are both much increased by it."

And thus it is evident, as Mr. Latham well concludes, that there are two great classes interested in the management of the roads—those who use the roads and are the proprietors of horses and vehicles, and the ratepayers who have to pay for their maintenance and repairs. At first sight these two classes may seem to have opposite interests; but when the subject is fully considered in all its bearings the interest of both classes will be identical, for just in proportion as roads are good, greater facility is afforded for moving over them; and, consequently, the expenses of travel or receiving merchandise are reduced, which is so much saved to the whole community: and, moreover, roads of the best construction, by their freedom from dust and mud, in a great measure provide for the comfort, and, by inducing a greater amount of out-door exercise, in a sanitary point of view, the health of the inhabitants.

The reader will from these practical observations reasonably conclude that the repair of our roads is not nearly so simple a matter as it is sometimes imagined. The kind of persons, however, who were formerly too often appointed as way-wardens, pretty clearly indicated that such was the opinion very commonly entertained by those in whom their appointment rested. By a recent Act of the Legislature the roads of the country are now divided inte districts, and proper surveyors will generally be appointed. These, however, will only repair the public ways—the private roads will still require the care of the adjoining owners; and it is for these that the facts I have collected are chiefly intended.

TEXTLESS NOTES.

BY A CROTCHETY FARMER.

Judging from the number of my "notes," the reader who has done me the honour to give a glance at them may suppose that it is an easy matter for one disposed to be crotchety to find crotchety subjects to write about, or failing to find the crotchety subjects, to write about any subject in a crotchety way. I rather think that if he were to try his hand in this line of mine, he might not find it to be quite so easy. To be sure, if by merely expressing an opinion which happens to be at variance with that held by another is to be crotchety, then the matter is easy enough; so that in this way every honest and candid opinion, so that it be not the opinion of some one else, is sure to be a crochety one. And surely I am not very uncharitable to say that there are not a few who do think crotchetiness is so created. I am not going here to attempt, and if I did, it is just as likely as not that I should fail if I did attempt, to define what crotchetiness is: sufficient for me to say now, that I am quite disposed to lie under the imputation of being crotchety, even should the term convey no other meaning, or that mainly, than that which I have noted above. One may well-nigh feel comfortable at being called "crotchety," if to be crotchety is to be honest in the expression of one's opinions; and certainly, in this view of the matter—which, as I have just stated and may state again, is no uncommon one—I am not the only crotchety man who writes notes in this journal: the Editor thereof may, indeed, be enrolled in the list. Nor am I otherwise than highly pleased to class him, in this sense, as one of my kidney, as assuredly he will be classed by some who have read some of his recent straightforward and honest opinions on sundry matters connected with farmers, what they should do, what they might do, what they could do if they would but do, but which, nevertheless, they do not do. These articles—or rather, the opinions which make up the articles—are, in the technical phrase of newspaper mechanism (so to term it) called *leaders*; but will they lead? or rather, are those who read them disposed to be led? I trow not, in the case of a few—shall I say a very few? Who knows? Not a little has been said—and written too, for the matter of that—by the upholders of commercial and trade callings, which are always, somehow or another, made to appear as if they in their interests were opposed to Agriculture in hers. That, by the way, I may parenthetically remark, *is* a crotchety notion with a vengeance. Well, not a little has been said as to the wretched indifference of farmers to all matters connected with progress—progress in all departments, not merely connected with their own matters, in which they are or should be—a distinction with a difference — interested, but in matters social and political generally. Such has been the language adopted by those who have "taken up this line," and who see nothing right, but everything wrong, out of their sphere of cotton and commerce—that by no means in many cases elegant, however forcible, it seems to read to those not prejudiced as "very like a libel." But, really, when we read one or two of the "leaders" which have lately appeared from the pens of those who *are* truly the "farmers' friends," we feel that it is worth while to ask if it is a libel? I may pause for a reply, but if I do I shall pause long enough before I get it. Take, for instance, the malt-tax agitation—or, indeed, any other agitation which has been got up, or attempted to be got up, of late, bearing upon the interests of the farming community. Community, do I say? This word, one is almost compelled to say, does not apply to them, if it means what it is generally supposed to mean. Where is the evidence of the "community?" Community of interests there is; but where is the commuity of determination that things which they say should not be shall not be? I have read of some affected fellow, who, wishing the bell to be rung, requested some one to "agitate—haw!—agitate the community." I wonder what bell it will be that will agitate *our* community. Truly, truly, when our friends of the Manchester and other communities, deserving, from our present point of view, of the name, witness the attempts made at, and the results of our "agitation," they may well sneer at them, and pass them aside as utterly unworthy of notice, and things not to be feared. Such agitations as *we* get up are not likely to agitate any Prime Minister, or touch the conscience of any Chancellor of the Exchequer. Stronger winds must blow before the sturdy oaks of office bend to the blast. Bend the oaks! Truly, metaphorically speaking, the wind we raise is scarcely fit to wave the weeds which decorate or infest our fields. And is any reader of mine crotchety enough to suppose that any Government will pay any attention to such feeble blasts of doctrine or belief? Why, the very opposite has been, and will be, the case. The difference between the "agitations" of the farmers and those of other bodies is this, and it is a mighty one—we agitate as if we did not believe in or care for the truth of our agitation; they agitate, and agitate successfully, because they believe in what they agitate: at all events they believe *this*, that they will get what they agitate for, if only they agitate powerfully and persistently, whether the thing is true or not. That is the spirit of a true agitation; and we may talk at our Farmers' Clubs, and at our Chambers of Agriculture till doomsday, if we only talk, and do nothing more; and rest assured of this, *nothing more will be done.* The proverb "All cry and little wool" will best illustrate what our position will be. When will the farming community cease to believe that their position will be just what they *please to allow it to be?* I am not here broaching, or caring to broach, any question of a purely political kind, although I am at a loss to conceive why political questions should be ignored by us, as they too often are; for political questions do involve others of the highest social as well as professional importance; but one truth, as put by my friend the Editor of this Journal, must not be overlooked—that, if the farmers wish justice done to the questions in which they are interested, they must do justice to themselves, assert and maintain their proper place in the body politic of our nation. This will doubtless be read by those of the opposite school—that is, if they deign to read an article in anything so "slow" as an agricultural paper—with some surprise, as they hold that all the political power of the kingdom is held by the agricultural interest. A word to the wise: this is not, nor will be, till the landlords and the farmers pull in the same boat, and desire to row for the same haven. Why they do not—as in too many cases they do not—is, I suppose, one of those Dundreary things which no fellah can understand. Everything around us in the political world tells us that we are on the eve of great changes political; and the opportunity which is thus afforded to the farmers of Great Britain for asserting their rights and demanding their place should be taken advantage of—nay, *must*, for if is not, it is exceedingly questionable whether it will ever be given them again. Far be it from me to stir up political strife, and to sound the note of alarm for opposing parties to meet; but political *life* is not, and need not tend to strife—nay, rather it will prevent it. For let the farmers remember, that with political power they gain to themselves a vast social and moral power. Let them look around them, and say whether there are not many things which are yet to be done before the burden can be made easy and the oppressed go free. There are a thousand outlets for the exercise of a noble and a generous philanthropy; the ignorant to be taught, the homeless to be sheltered; the widow, the fatherless, and the orphan to be cared for, and the degraded raised to a higher and a purer life; until the blessed day shall arrive, when justice shall everywhere be tempered with mercy, when the wrong shall be right, and the right every man's portion; "When the rich shall help the poor, and the poor shall love the great." God speed the happy time, crotchty or not crotchety as the wish may be.

ON LAYING DOWN LAND TO PERMANENT GRASS.

SIR,—The astonishing rapidity with which our manufactures have progressed of late years, the relaxation of our import duties, and the great influx of gold from Australia and other countries, have stimulated the employment of an immensely-augmented population, and, consequently, increased to a very large extent the wages in all branches of labour. As it naturally follows that a wealthy industrial population will feed largely upon animal food, and the principle being generally admitted that corn can be readily imported at a much less cost than cattle, it suggests the advisability of laying down to grass those poor soils which will not pay the farmer in tillage with the present high price of labour.

As the season is fast approaching for sowing the land designed for permanent grass, allow me to throw out for the benefit of landowners and practical farmers a few hints on this subject, which are the result of my own observations, and which, I think, are confirmed by the experience of the most intelligent and successful agriculturists. In the first place, it is presumed that the land is drained, clean, and in good condition, and that it has been well fallowed and limed before putting in the seeds, which should be sown with a thin crop of corn of the short-strawed variety, the growing corn being of great use in sheltering the young seeds on a strong soil.

A great many agriculturists argue strongly against pasturing with sheep or stock the first year, and advise that the grass shall be mown. This is, there can be no doubt, an erroneous idea, because if the long, heavy grasses (which are the earliest) are allowed to grow up, they will smother the clover and fine seeds soon after they appear, and ruin the pasture; but if the seeds of such grasses are selected as will succeed each other, cattle, and even sheep, will do the new-laid no harm. If the long, early grasses are eaten off as they grow, by the middle of June they will make way for the clovers, alsike, and other fine grasses to come in. Thus there will be kept up a rich pasture all the summer by a rotation of grasses succeeding each other. Horses (particularly those in work) do a permanent injury to young pastures, as they exhaust the land of phosphates very quickly. New-laids and grass on very strong land are mostly very poor in phosphates—so much so that the cattle cannot obtain sufficient phosphate of lime from the grass to keep up the wear and tear of the bone in the animal—hence such cattle often take the bone disease called "bone evil" or "cripple felon." By applying crushed bones liberally to such land, the bone-making elements of which the land has been exhausted are thereby restored, and the disease is got rid of; and, in addition, a luxuriant pasture appears in the place of the bare new-laid.

The first year is the most critical period in the existence of the young crop—in fact, the future prosperity of the pasture very much depends on the generosity of the farmer at this time to the land, which ought now to have a good, stiff dressing of farm-yard manure; but if this material be not sufficiently plentiful, then I would add an equivalent in bones, crushed to half-inch size. In the following spring the land should be well rolled. If it happen afterwards to be pastured with sheep, they must not be allowed to eat it too bare. Occasionally for some years (especially on cold, clay land) the pasture will require a dressing of farm-yard manure to keep it in an improving condition. If the farmer be not willing to deal thus liberally by the new pasture, I would advise that he should not lay strong land down at all, for it would undoubtedly yield him a better return in corn crops.

As occupiers from year to year must have in some cases a reluctance to make such an outlay, if the landlord and tenant could come to a mutual understanding on the improvement of grass land it would materially conduce to the interests of both. To effect this object I would suggest that the landlord give the new-laid a dressing of one ton of half-inch bones per acre. This would cost £7, and if the tenant agree to pay 6 per cent. on this outlay, it will add eight shilling per acre to his rent, but, I will venture to say, it will increase the agricultural value of his land fifteen shillings per acre.

In thus drawing public attention to this matter I would guard my position from any supposition of being an advocate of speculative or unpractical theories. I have for some years considered the subject, and my observations have clearly demonstrated that money judiciously laid out in the improvement of grass land brings in a more certain return than when expended in the growth of corn.

Before concluding, I would just mention that there is another point to be observed with regard to laying land away. It is a common cause of objection amongst farmers to sowing down with grass, that the herbage to a large extent disappears and the pastures have a poor appearance after the second or third years. Natural pastures possess a luxuriance of herbage which new-laid pastures do not. The reason of this, which appears to be generally unknown, is, I have no doubt, mostly to be found in the fact that pastures of the former class are composed of grasses which are indigenous to the soil, whilst the latter are not. There is no doubt, however, that in some cases failure does not arise merely from the uncongenial nature of the soil, but that the want of a liberal supply of manure (as I have before mentioned) is the sole cause. I think, therefore, it will be conceded that in laying away land the suitability of grasses to the soil is a matter of first consideration.

By a liberal manuring you may temporarily succeed in getting a good pasture—even from seed unsuited to the soil—but sooner or later it will die off. Too much care, therefore, cannot be bestowed in the selection of grasses which are natural to the soil. I am, sir, your obedient servant,

SAMUEL RICHARDSON.

80, *Bondgate, Darlington, April* 4, 1867.

THE BREEDING OF HORSES.

BY A PRACTICAL FARMER.

This is a very important department of farm practice, and cannot be too carefully and judiciously carried out. I do not presume to write with any particular wisdom or judgment upon the question, but I think that the pages of this magazine should at this precise season call the especial attention to breeders to it. Well-bred horses are of much greater value than any of the other animals bred upon the farm, and consequently ought to receive the greater attention, and I will offer a few common-place remarks upon the course which I think should govern ordinary practical farmers in the breeding of horses. It is preposterous to go on breeding cocktails or common farm horses. Every breeder must elevate his notions of breeding horses. It is truly ridiculous to see men of good business habits putting up with almost any entire horse covering at a low price, or which may "travel" past or through their farms. Just for a moment think of the number of horses whose marketable value rules between fifteen and twenty-five pounds at five years old! Such horses are not worth breeding, neither for sales or farm service. To perpetuate such is sheer folly, because there is no necessity for the practice. At every respectable show of stallions there are good useful horses to be seen: such only should be encouraged; the rest discarded. No animals with which we are acquainted, so closely produce their like as horses—not only in their contour and outline of frame, proportions, and limbs, but their very marks, habits, temper, and paces. These form so many items for consideration in the choice of a sire, and require to be carefully weighed by every breeder in the selection of a horse to put to his mares. Unquestionably the best horse should be chosen; but where the balance of good qualities are nearly equal, then the breeder's convenience may enter largely into the decision. Should any breeder be the fortunate owner of a mare of transcendant qualities and proportions, no expense or trouble should be spared to put her to the best horse that can be found. Our railways now present such unusual facilities for such transit that I venture urgently to press its adoption. Who knows to what a price a racing colt might attain, from such careful breeding? or a hunter, nag, or drayhorse? There are plenty of common horses bred everywhere. It is only by much extra care that our best horses are forthcoming. This is the very season for making such selections. The breeder therefore should give himself no little trouble in visiting the more popular shows. It will not do to leave these matters to chance, as is too commonly the case, "just to see what horse is coming my way, so that I may unharness my mares, and put them to him without any further trouble." I have a beautiful young cart mare, quite a case in point. I had to send her dam every Saturday a considerable distance to meet the horse, and let her remain till Monday. It was inconvenient; but the mare is of double the value of others bred the same year, and she will perpetuate the breed. Farmers must not, I again repeat, be afraid of a little trouble and inconvenience at this season of the year.

The *Farmer's Magazine* for April, with very commendable attention, gives a list of upwards of two hundred first-class horses of racing celebrity, together with their places of standing and price of covering, many of them at high figures—*i. e.*, Blair Athol, 100 guineas each mare, and his list made up; Gladiateur, at 100 guineas; General Peel, Asteroid, Ely, Marsyas, Saunterer, St. Albans, and Young Melbourne at 50 guineas each. Then we have Wild Dayrell at 40 guineas, and Crater, Dundee, Kettledrum, Knowsley, Oxford, Rataplan, and Scottish Chief at 30 guineas each. Again, we have Citadel, Knight of St. Patrick, Prime Minister, and Thunderbolt at 25 guineas each, and no less than 23 horses at 20 guineas each, with upwards of 80 horses at from 10 guineas to 18 guineas each mare. Verily, this would augur that our racing men are by no means relaxing their efforts to keep up the breed of racehorses. It is a good example for general breeders, as these prices could not be realised except by a corresponding demand for the use of the horses. I wish a list of some of our best dray or cart stallions could also be given. Many would take advantage of the information, and send mares by rail or otherwise to them. There is great difficulty in advising ordinary breeders of farm-horses as to their best course. It is comparatively but few who possess mares of sterling worth. The majority of mares in daily work upon our farms are just what would be called useful, good every-day workers; and as such they continue from year to year, and from these foals are had continually. I want our farmers to take a look higher. Most of them have laudably improved their breeds of cattle, sheep, and pigs; but to improve the breed of horses seems to be beyond their province. It is true there are numbers of intelligent, enterprising men, who do very properly take up this department of their business in a right spirit. We could point to many such; but they are exceptions. The rule is quite in the opposite direction. This ought not to be. Let me counsel our common breeders just for a word or two. Do not put a defective mare to horse at all, and for the same reasons you would not put a cull ewe to the ram, or a failing heifer to the bull—you are sure to propagate a bad breed. No; either sell your "cull" mares, or work them to death; don't breed from them. On the other hand, put your best mares to the best horse you can find, and you may depend upon the result.

Much might be said relative to the management of mares prior to taking the horse. It is quite the custom to keep the cart-mares in constant work. When the horse on his rounds calls, the mare is taken out of the shafts it may be, or from the plough, or such other work as she may be engaged in, and if in season she takes him, and goes to work again at once. Now, from long experience, I am convinced that this is a very improper course. We know if the horse is over-heated or over-worked, he generally fails to leave effective "seed." It is so with the mare. If she takes the horse in all the heat and perspiration of a hard day's work, it is very unlikely that "she will stand to the horse;" and hence it is that so few foals are left. It is far better to let the mare rest for the day when she is expected to take the horse, and, as soon as she has taken him, let her be put somewhere alone and in quiet. "But," says the farmer, "it will stop a team—I can't spare her." Well, but there is policy in this. You have to pay for the use of the horse—by all means give both horse and mare a fair chance, or you pay for less value received. Always inquire the length of time since the horse had his last mare. If very recently, or within an hour or two, let him wait awhile. Never mind the groom or leaders—they are always for getting on. Make them wait till you think all is right for due service. The mare foaling: Every attention should be given to the mare when about to foal, or danger arises to the foal. I once had two mares foaling at the same time—the stables not far apart. We had not left one mare, to attend to the other, for ten minutes, before she foaled, and the foal was suffocated in "the clearings" before we returned. Warm water and warm mashes of bran and oats should be given, and draughts and cold should be avoided. Upon the first fine day, when the foal is strong enough to walk and play about, let the mare be led to a warm paddock and be left to graze for the day and shut up at night till the weather is warm. If she appears dull and restless, let her have either a purgative or diuretic dose, according as she appears to require such help.

[In common acceptation "a cocktail" is anything not thorough-bred; so that for riding purposes a cocktail, say by a thorough-bred horse out of a half-bred mare, would be the sort that a farmer must breed.—Editor.]

THE ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The monthly meeting of the Council of this Society was held at 42, Upper Sackville-street, on Thursday, March 28th. Sir George Hodson, Bart., in the chair.

The other members present were—Lord Talbot de Malahide, Lord De Vesci, Lord Clonbrock, Lord Cloncurry, Lord James Butler, Sir Robert Paul Bart., Sir Percy Nugent, Bart., Sir Allan Walsh, Bart , Hans H. Woods, William Donnelly, C.B., Robert Borrowes, Phineas Riall, R. M. Carden, Edward Purdon, Charles Colthurst Vesey, Alexander E. M'Clintock, Robert Wade, Leopold Cust, Hon. St. John Butler, Henry Dolan, and P. M'Evoy Gartlan.

The minutes of the last meeting were read and confirmed.

Mr. Wade brought up a draft report from the premium-sheet committee of the premiums proposed to be given by the Society at the forthcoming annual show, to be held in Dublin in the month of August next.

The report was ordered to be printed and circulated amongst the members, and brought forward for future consideration on that day fortnight.

A very general feeling was expressed as to the importance of having steam ploughs exhibited and tested during the Show.

The following new members were balloted for and elected unanimously:—Rev. Richard W. Bagot, Fonstown Glebe, Kildare; Fergus Farrell, Ellenfield, Drumcondra; Tristram Kennedy, M.P., Henrietta-street, Dublin; James J. Dunphy, Ballinamona House, Derrygolan; and Thomas Manly, Aberdeen House, Raglan-road.

The monthly meeting of the Council of this Society was held in Upper Sackville-street, on Thursday, April 11th. Sir Geo. Hodson, Bart., in the chair. The other members present were: Lord De Vesci, Lord Cloncurry, Lord James Butler, Hon. Chas. J. Trench, Hon. Bowes Daly, Hon. H. King Harman, Sir Allen Walsh, Bart., Sir Percy Nugent, Bart., Lieut.-Gen. Hall, C.B., J. M. Royse, J. W. Naper, Wm. Owen, H. H. Woods, Joseph Kincaid, Phineas Riall, C. C. Vesey, Robt. Wade, H. J. M'Farlane, Peter M'Evoy Gartlan, Wm. Donnelly, C.B., W. Fetherstonehaugh, R. M. Carden, Edward Purdon, John Bolton Massey, Alex. M'Clintock, and John La Touche.

The committee appointed at the last meeting of the council to investigate the ralationship which existed between the Society and the Farmers' Club brought up their report, which was read, and ordered to lie on the table until the next meeting of the council, to give an opportunity for further conference. Although Lord De Vesci moved the adoption of the report, which was seconded by Mr. Kincaid, he consented to withdraw his resolution in consequence of the observations of Mr. M'Farlane, Mr. Gartlan, Sir Percy Nugent, and others, for the reasons stated.

A letter was received from Mr. Barnes, offering a field of his on which to hold the forthcoming show of the society. The chairman directed that the letter should be acknowledged with thanks; at the same time to state that a site for the show has been already procured.

The local prize sheet was laid before the council with the amended rules, which were adopted.

Mr. Wade, in bringing up the list of premiums proposed to be given at the society's annual show, said it was necessary that he should make one or two observations. The premium-sheet committee asked the council to adopt the prizes, authorizing the offering of £1,203 in premiums at the ensuing show. They requested permission to adopt the premium-sheet, because the whole sum placed at their disposal by the finance committee was only £1,000, so that the additional £203 was contingent on the power of the local committee giving that sum towards the premiums. In general, when holding their shows in the provinces, the local committee were in the habit of offering local prizes. It was considered that being more the show of the country in general than one in the provinces, it would not be so advantageous to the general features of the show to offer local prizes, and that it would be better that any moneys the local committee could give, in addition to the £1,000, would be better spent if distributed over the whole area of the show than given to any particular class which might be thought of local interest. Therefore, in adopting that prize sheet, the £1,203 could only be given contingent on what the local committee might be able to give them. In the schedule of prizes the £332 offered for horned cattle would not be diminished under any circumstances. In the £300 offered for horses, there would not, under any circumstances, be any diminution, and the £215 offered for sheep would remain intact, as would the £78 offered for swine. Now, how were they to get the £200 odd required? and they should ascertain whether or not the local committee would be able to give them any assistance. The premium sheet committee proposed to add to the poultry department £100 over and above the sum usually given to prizes for poultry. They likewise proposed to increase the sum offered for butter by £50, and then they proposed to pay £50 for the bringing over of a steam plough. These several items amounted to more than the £203. In offering £100 more than usual for poultry, it struck some gentlemen it was extremely odd that an agricultural society should give £132 for poultry, while they only offered £131 for shorthorns. In dealing with the £100 offered for poultry, it should be recollected that they were not voting away their own money, but the funds of the local committee. There was no doubt, however, that this department would attract a great many additional visitors to the show, and thus considerably increase the funds of the local committee. They were also very anxious to add some money to the prizes offered for butter, because in a city like this the butter market was a matter of consideration to the locality, as being in the vicinity of the Co. Wicklow, which furnished a large supply of fresh butter. They likewise asked to be allowed, in case the funds of the local committee exceeded £200, to have two or three sections in the horse class, upon the same principle as they distributed the money for poultry. There was, perhaps, nothing which attracted more notice than a good horse show, and they proposed to open classes for hunters, which they had not before, because they had kept in view as much as possible what would be of advantage for the farmers' more than the gentlemen's class. If they had sufficient money they would have a class for yearlings. If the money at their disposal was sufficient, they might add from £50 to £80 for the exhibition of steam ploughs, as it was considered useful to have some other machine in addition to that of Messrs. Howard. Some persons would like to see Fowler's steam plough, which would entail additional expense.

Major **BORROWES** stated that this question had been already decided in getting over one of Messrs. Howard's ploughs on payment of £50. However, if sold, he would not ask the amount. It had also been agreed to get up an outside subscription for the purpose of exhibiting one of Mr. Fowler's steam ploughs.

Mr. **WADE** said the only other thing for which money was wanted was for flax. In this department they only offered a prize of £12. If funds were available they might offer a larger premium for flax. No prize, as had been the case at the last two shows, was proposed to be offered for flax scutching machines, in consequence of the little merit possessed by those exhibited. It had also been determined to open a special class for Border Leicesters, believing that they were more hardy and better suited for our climate than the English Leicesters. In conclusion, he moved the adoption of the premium-sheet as submitted, subject to such additions or alterations as might be deemed advisable, contingent on the funds at the disposal of the local committee.

Mr. **DONNELLY** observed that Mr. Wade referred to offering £130 for poultry, while prizes amounting to only £12 were proposed to be given for flax. Considering the object for which it was intended to apply those sums, it appeared to him that the amounts were somewhat disproportionate.

Sir **PERCY NUGENT**, while conceding that the prizes offered in the two classes mentioned were somewhat disproportioned, reminded Mr. Donnelly that power was given to make whatever alteration was deemed necessary in the premiums to be offered.

Mr. **WADE** believed if additional funds were available to enable the committee to give the increased prizes for poultry, the result would be advantageous, inasmuch as there was nothing of interest to the generality of visitors in the flax department; while cocks and hens would attract attention, and add to the receipts of the local committee.

Mr. **KINCAID** stated that £1,000 had been voted by the finance committee for the show, and they should guard against any resolution being passed, which would be most irregular, increasing the amount to £1,200.

Mr. **WADE** did not think they need entertain any apprehension on that head, because the local committee would make up that deficiency. However, to meet any objection he would alter his resolution, so as to meet the wishes of the council.

Sir **ALLAN WALSH** seconded the resolution as amended, which was passed unanimously.

Mr. **M'FARLANE** brought forward the following motion, of which he had given notice :—" I give notice that at the next meeting of the council I will move that a sum of £20 and a medal be allocated as a prize for a short practical work on the best and most economical mode of general drainage, and that it be a direction to the judges or examiners of this paper to give a preference to the work which gives the most distinct directions to any farmer undertaking drainage, and refers to the most varied amount of successful drainage effected in an economical manner, with an account detailed of moneys absolutely expended in wages and material on such work of drainage referred to; the subsequent management of the land drained; whether it is retained in grass, and, if broken up, the results of subsoiling or deeper cultivation." In placing that notice on the book, he said his object was to get a short work which he could place in the hands of farmers, to enable them to drain their land in an economical and satisfactory manner. He also wished that it should be written by a practical man—a man who had carried on drainage, and who could give them some account of the quantity of work which he did for a certain amount.

Sir **PERCY NUGENT** conceived that several valuable treatises on drainage could be found in the agricultural libraries of the city.

Mr. **M'FARLANE** explained that what he desired was to have a short work on the subject, which could be put into the hands of farmers. There was no doubt that persons differed very much as to the mode to be adopted in the drainage of land.

The **CHAIRMAN** hoped the members would recollect the scrape they got into on a former occasion on giving a premium for a work, without considering whether or not it was worth printing.

Mr. **M'FARLANE** observed that he had worded his resolution to guard against such a contingency.

The subject was referred to a committee consisting of the Hon. Charles J. Trench, W. Fetherstonehaugh, H. H. Woods, William Owen, and H. J. M'Farlane.

The following new members were balloted for and unanimously admitted :—John Greene, Millbrook, Athy; W. R. Bulwer, Barrowfort, Athy; Henry Greene, Court Hill, Dunboyne; and Chr. O'Connell Fitzsimon.

HIGHWAYS AND BYEWAYS.

THE BOROUGHBRIDGE AGRICULTURAL ASSOCIATION.

At the dinner of this Association, the Chairman, Mr. **LAWSON**, read a paper on "Highways and Byeways." He said: The subject I have chosen is, I trust, both interesting, useful, and suggestive—it touches both our hearts and our pockets, and is intended as a slight contribution towards, as it were, paving the road by which "bright improvement on the car of time"—possibly a railway car, as the Yankees would say—shall transmute our miry highways and our clayey byeways into dry and solid means of locomotion. This district in which we live is a singularly appropriate one in which to consider the moot questions especially involved in highway management. Around this spot in early days, under Rome's imperial sway, some of the finest, best-constructed, most durable roads marked the era of the Roman occupation of this island. Say what we may, or deprecate as we may the works of antiquity, there still exist sufficient remains of old Roman roads, often running nearly parallel with our modern turnpike-roads. There was one great secret of the success of the old roads—those early monuments of Roman industry, perseverance, and skill were entrusted to the superintendence of men thoroughly versed in the profession (for then it was a profession) of road-making; and if practice ever did make perfect, then these Roman road curators, contractors, or surveyors must have been on the very threshold of perfection. Good roads were looked upon of old as the uprooters of barbarism, and the promoters and handmaids of civilisation. It has been well said "it was the road, not less than the legion, which made the Romans masters of the world." The mighty conquerors of old, and the "Iron Duke," the hero of Waterloo, were of one accord as to the necessity of good roads for military campaigns. Good roads, moreover, are the pioneers of agricultural and commercial prosperity. The turnpike roads of England, before the "iron age" set in, were admirably adapted for travelling; but now the wasteful grass silently encroaches upon them, and, with diminished tolls as a necessary result, we find deteriorated roads. Can we forget the narrative of the efforts of the last century, when blind John Metcalfe, that monarch of road-makers, contracted for a considerable portion of the road between Boroughbridge and Knaresbro', how he devised the plan for bridging over the River Tut near the Little Mills in this town, and how he carried his designs into execution—marring perhaps their full value, by proposing to quarry the stones of the old Roman walls at Aldborough, that they might serve as a background to his new road? Metcalfe, indeed, startled from their profound lethargy the road-patchers and the road-tinkers of his day, and his good example acted as a stimulus and spur amongst the highway surveyors around, urging them on to improve the highways pertaining to the villages adjacent to the Knaresborough road. Much energy was required in all parts of England in Metcalfe's day to prevent the roads from sinking into mere tracks. Even near the metropolis itself in the year 1736 we read that between Kensington and London "there was an impenetrable gulf of mud;" from one end of the kingdom to the other complaint was rife against the roads. Trade languished, and highwaymen alone flourished. It is worth noticing, by the way, that one of the first laws on highways was passed in 1285 in reference to these freebooters, directing all the bushes and trees along the road leading from one market to another should be cut down for 200 feet on either side, to prevent robbers lurking therein. I have said sufficient as to the past; let us now turn to our own day, and attentively survey the condition of our highways. Am I wrong in saying that there is great room for amendment in them? Certain it is, let an impartial judge decide, we are not living in the age of *stone*, nor is there much *metallic* currency, either in the local or more usual sense of the word metal, to be traced on our highways and byeways. The unstoned road is, too often, a sea of mud, rendering the conveyance of agricultural produce a labour of much time and no small toil. The centre of the highway is often hollow and unduly depressed, and calculated to act as a tank or cistern for holding water; and I have seen an old cunning stager—a road-maker—hacking up one side of the road to find materials (themselves "used up") to patch up the other. Then add to all other obstacles and impediments to a good road, high fences impervious to the sun, and ditches unscoured and full of rubbish. I fear that the condition of many of our highways might be generalized by the description of the North Riding highways, furnished a few years ago, which was almost invariably rutty. Yet who would imagine that this would apply to our Claro district, who is conversant with the rose-coloured reports each year emanating from the surveyors of the different parishes? The quality of the stones used in repairing the roads is often very inferior, and ill-adapted for the object of permanent restoration, which should always be kept in view as of primary value. A soft sandstone is rapidly pounded to powder under the heavy wheels of a ponderous waggon. We want a stone like the whinstone wherever it is procurable. A quantity of this stone was used on the Northallerton turnpike road near the Boroughbridge railway station a few years ago, and with very beneficial effect. A little present disbursement will often avert large future expenditure. Our highway surveyors, I am sure, wish to do their best, and spend much time and much thought over the duties of their onerous office. This being the case, some may enquire why then are the fruits of their labours so little evident? Why does the jolted, wayworn, indignant traveller protest so strongly and vehemently that the roads should be under better management? I think that the reason is obvious. Good intentions won't make good roads. Experience in this art, as in all others, is requisite; and when surveyors are changed year by year, they relinquish their office just as they are obtaining some insight into its mysteries. I think you will find that where a wiser custom has prevailed, and the love of change has not poisoned the parochial mind, smoother and better roads, at which even Macadam would not have stumbled, are by degrees secured, and rates are legitimately reduced. An old friend of mine told me that when he lived in the East Riding he noticed the great detriment which the highways suffered from the annual change of officers, and he prevailed upon the same surveyor in a particular parish to retain his surveyorship. I believe that twenty years have elapsed since that surveyor entered upon his work, and the result, I understand, has been that the highways under his charge are model specimens of what roads ought to be—patterns of excellence combined with economy. I find that at Ebberston, near Pickering, a like result has rewarded the efforts of one who has been a highway surveyor there for many years—Mr. Baker. The cost of the excellent highways in his parish is, if my memory serves me, about £10 per mile per annum. In past times, in this district, we have had improving surveyors, and we have had impoverishing surveyors: the latter were wont to pride themselves on their parsimony. If their improving successors asked for a larger highway rate, which was necessitated by the shortcomings of their predecessors, then the ratepayers' ears were regaled by the ex-officers, whose theme was their own praise as masters of economy—forgetting that the increased expenditure resulted from their own neglect, and that a "stitch in time" might have obviated the deep rent made in the pockets of the ratepayers. Surely it would be to the great advantage of any parish, even at a trifling sacrifice in the shape of remuneration for services rendered, to secure the continuous labours of gentlemen who have evinced decided talent for road administration. The points in connexion with our highways which I wish to establish are, first, the re-election of skilful officers—men of observation, men of industry, whose hearts are in their work as highway surveyors. Sure I am that annual change is an annual loss to the roads. It was well remarked at a recent meeting at Pickering, that "the rotation system was the ruin of highway management;" "the proper man, when found, was not kept in office, that was the fault." Secondly, I would venture to recommend the purchase of a more enduring material, wherever feasible, for the roads. Thirdly, the better distribution of that material, and greater care to be applied to laying it on, so that one section of a road may not be overfed whilst another is starved. I think too that some highways require a few extra hands to accomplish the due amount of work upon them. We have no need to make a long pilgrimage to learn a lesson in road-making. The Ripon turnpike road is, without doubt, *the* specimen in our neighbourhood of good management, being so solid, so compact, so admirably sloped, so well ordered. I speak, of course, of its construction. Although I must again revert to highways, I should wish to say a word or two, in passing, on byeways, driftways, or occupation roads. Some persons are accustomed to associate the idea of the picturesque and romantic with these byeways; but their illusions will be rudely dispelled if they should visit them now, when the storms of winter have left them more water-shaken than ever. Whilst I own that I do not see reason to dread that the adoption of the Act (25 and 26 Vict., cap. 61) "for the better management of highways in England" would ever ease the expenditure on the highways, I believe its effect would be the contrary; still I have a great aversion to that system of centralization, which virtually takes out of the hands of the ratepayers in the several townships the management of their own affairs and the distribution of their own funds. Whatever course is adopted, we should carefully sift and weigh the tangible evidence which existing Highway Boards furnish us with. We shall find, on the one hand, men like Sir Edward Kerrison, at the Hartismere Highway Board, in Suffolk, and he is no mean judge in matters connected with the welfare of the county, described as saving £500 in the past year as compared with the annual average expenditure before that Board was constituted; but as the surveyor had been "turned out to grass" early in the summer of 1866, owing to a dissension among the waywardens, and so much needful work would be stopped, possibly this year's expenditure may not show so satisfactory a balance on the right side. I see also that the Chairman of the Blackburn Highway Board, in West Suffolk (Mr. Nunn), has lately stated that "he was at first decidedly opposed to the Act, but during his three years' experience he had seen that it could be made to work beneficially, and that the expenditure would probably be reduced below the amount of the average previous to its adoption." Again, Major Wilson asserted at the same meeting, that in the Mildenhall district, also in West Suffolk, £1,000 had been saved by the operation of the new Act in three years. Such are the favourable testimonies. On the other hand, we find certain Highway Boards almost with one consent petitioning for their own dissolution, on the ground of the unsatisfactory results of their labours. I leave this important question in your hands. Let us draw, from every available source, what authentic evidence we can, so that we make no leap in the dark. In highway reforms, as in other reforms, let us be wary of too precipitate action. We are all aiming at the common good; let us give each other full credit for this; and rest assured that our one object is the improvement, consistent with due economy, of our highways and byeways.

After some discussion,

Mr. Lomas moved, "That it is the opinion of this meeting that the adoption of the provisions of the new Highway Act would materially increase the burdens of the ratepayers, without resulting in a corresponding compensatory equivalent."

Mr. Lund seconded the resolution, and it was adopted.

THE CONDITION OF BRITISH AGRICULTURE.

A LECTURE DELIVERED BY MR. J. J. MECHI, AT THE FARINGDON FARMERS' CLUB.

The subject upon which I propose remarking to-night is so large a one that I must confine myself to a consideration of a few of its most important parts, with a view to stimulate experiment, discussion, inquiry, and comparison. An unprejudiced inquirer, taking a general view of British agriculture as a whole, would naturally compare its condition with that of our other industrial occupations, to see whether a due and proportionate amount of skill, capital, enterprise, and general intelligence characterizes its operations. Let us test this by comparative results. By the extensive use of costly steam-engines, complicated machinery, and scientific inventions and discoveries, and by enormous investments of capital, every necessary of life (excepting food) has been increased in abundance, and greatly cheapened in cost. No such result has taken place in agricultural home productions, for agriculture languishes in the trammels of antiquated customs and strong depressing influences. So far as our imperfect statistics of agricultural produce can be relied on, the evidence is that our produce has very slightly, or not at all, increased, and that, instead of having become cheaper, our meat, butter, cheese, and milk, have all greatly advanced in price. In spite of extensive areas of old pasture having been broken up and worked out with corn crops, we are dependent on foreigners for an average annual importation of 6,500,000 quarters of wheat alone (that quantity being increased this bad harvest to 8,000,000 quarters), while our average annual home-growth of wheat is only 12,000,000 quarters—12,000,000 of quarters over an area of nearly 60,000,000 of acres! Can anything that I may say add to the disgrace and humiliation of such a statistical fact, seeing that we are so overdone with surplus capital that our loans to foreign nations, independent of other foreign investments, may be probably 200 millions sterling, and that in home railways alone we have an investment of £500,000,000? Our natural production of wheat, at the average of 56s. per quarter, presents the ridiculously comparative sum of £34,000,000! this for the daily bread and annual feeding of 30 millions of people! On my poor farm of 170 acres, the annual production of wheat is more than 250 quarters, and other grain in proportion; so that if the rest of the kingdom did its duty equally with my poor soil, our annual produce of wheat, instead of 12,000,000 of quarters, might be 88,000,000 of quarters. This is no comparative exaggeration; for, of my 170 acres (landlord's measure), only 50 are annually in wheat. Of course, from the area of 60 millions of acres must be deducted the space occupied by our urban population in their towns and cities, and a large space for climate unsuitable to the growth of wheat; but, with the most liberal deduction, there is the evidence of my farm that profitably we could enormously increase the food of man and beast, were we inclined so to do, and call to our aid for this purpose an immense increase of capital and intelligence. If I had any doubt as to the slow general progress of British agriculture, it would be removed by the census fact that our agricultural labour population is either stationary or decreasing. My experience has taught me that increased produce cannot be obtained without increased labour; for, leaving out of consideration the immense amount of labour expended upon drainage and landlords' improvements, the current labour of my farm is doubled as compared with that used before the improvements, and this too in the face of steam power, reapers, horse hoes, &c. Taking our production of wheat at 12,000,000 of quarters, it goes a trifle over 1½ bushel per acre over our 60,000,000 of acres. On my farm, over the whole area 170 acres landlords' measure, we have nearly 12 bushels per acre, and a proportionate increase of meat. I speak of my own farm reluctantly, and with no view to boasting, but am bound to quote it as an illustration, to show our national agricultural shortcomings. Now, without any desire to find fault, I am bound in honesty to say that our general agriculture presents a most uncommercial and unbusiness-like appearance, both as regards landlords and tenants. I hope that no one will take this remark as applying individually or personally, for I know plenty of agriculturists who are a credit and honour to their country, and it is because I know this that I am, on public grounds, anxious that what is now the exception should hereafter become the rule. Many reasonable excuses may be found for our general backward agricultural condition. We are, as it were, only just emerging from feudalism—the days when the lord or landowner and his tenants and dependants had to fight together in mutual self-defence, and when each estate was a little kingdom, where the lord was somewhat of a Paterfamilias to his tenantry and their labourers, having and exercising an undeniable control over them. Under such circumstances, without roads, railroads, or canals, such a primitive and uncommercial condition could hardly surprise us; but all that is changed now; and although the natural good-will and respect as between landlord and tenant should still exist, and, I believe, does so, still agriculture should now become a business, and requires to be treated on true commercial principles, if both landlord and tenant are to attain to a good pecuniary and social position. For see what is taking place elsewhere than in agriculture: merchants, traders, and manufacturers, freed from antiquated prejudices, availing themselves largely of modern improvements and scientific discoveries, have thus realized princely fortunes, and by these means and this acquiescence in change and progress, are gradually becoming owners of some of the finest estates in the kingdom. As a natural consequence, they acquire very increased political influence. So long as our estate owners, actuated by a most kindly but mistaken feeling, entrust their farms to retired superannuated gamekeepers, or other menial dependants, and are content with an unimproved rental in lieu of seeking for men of capital and practical intelligent knowledge, so long will their estates present as they do in too many instances a melancholy evidence of neglect and non-progression as compared with others where a different system has not only provided more ample food for the people, but has, concurrently, greatly increased the rental and value of the estate. My brother-agricultturists must forgive me if I say that they, too, have a good deal to answer for. The have not yet quite shaken off the mantle of old customs and prejudices, and they are a good deal inclined to "snub" myself and many like me who sincerely desire to see them in a more intelligent and (as a natural consequence) a more profitable position. I know of so many cases where landlords, being willing to invest capital in the improvement of their land, provided the tenants will pay a fair and proper interest for such investments, have met with doubt, disbelief, and in fact discouragement and non-acquiescence. In my own county, for instance, it is only after twenty years of hard fighting and discussion that some of my agricultural friends are beginning to believe that it is advantageous to drain those extensive, stiff, collapsing, unctuous tile-earths which suffer so much from wet seasons. In fact, it was only a few days ago that a wealthy landowner told me that his principal tenant declined to have his land of that quality-drained, for the water went off quickly by the stetch-furrows and water-furrows. Yet that landlord had gained a considerable sum by selling an estate in another county, after he had enlarged the fields, drained them, cleared away the timber, and erected proper buildings. I really ought to apologise for insisting here so strongly on agricultural progress, seeing that in this very neighbourhood there is one of the most bold and grand instances of change and progress that has ever graced an English estate; and I will venture to hope that, if that estate were to be sold to-morrow, it would realise a sum commensurate with the improvement which has come over it since its reclamation from a neglected condition. I feel that I am in Berkshire, where the necessity for improvement is cheerfully accepted and acted upon. In confirmation of my opinion of the advanced condition of Berkshire agriculture, I have only to refer to the following comparative statistical tables:

	Poor-law Board Return, 1854.	Cattle Census, 1866.
Cattle	14,024	30,149
Sheep	144,259	327,316
Pigs	24,888	41,265

The increase of live-stock is a certain test of agricultural progress. In this respect Berkshire stands pre-eminent—infinitely beyond many other counties. Can we forget that the good and lamented Prince Consort gave, by his example and patronage, an immense impetus to agricultural progress? I remember seeing at Windsor farm-buildings and machinery that, for utility and economy, might be safely adopted by many a landlord and practical farmer. The late Mr. Pusey, Sir John Conroy, the present Earl Radnor, and many others in this county, have done much to increase the food of the people. There is a growing faith in drainage, deeper cultivation by steam-power, covered yards, less timber, enlarged fields, better roads, more manure and less seed, reaping and mowing machines, and better implements. All this is encouraging, and gives us hope of a better future. Agriculturists begin to feel ashamed that they have for so long a time opposed statistical information, much to their own disadvantage. Public opinion, acting through our Legislature, has given to us a Government Registration Office for Land; so that a title once well proved will be no more endangered by the loss, by fire or otherwise, of some one or two old musty parchments, deeds, or wills. In that new but wonderful country, America, our intelligent cousins, who have still one thousand millions of acres of maiden land to dispose of, have had them all carefully surveyed, measured, mapped, and registered in a proper Government Office (what an extent of country as compared with the 77 millions of acres of our United Kingdom!) *The cost of transferring land* is in this country outrageously great and the delay proportionate. I will illustrate it by a recent case that came under my observation. A farm, nearly all freehold, worth about £6,000, which had been occupied by the owner for more than 20 years, was mortgaged. The costs were £200, and the time occupied nearly three months. The same farm was transferred about two years later, and, although the former investigation of title had been most rigorous, again the process was gone through at an expense of more than £200, and another delay of three months. Who would buy landed property? said a friend of mine, used to commercial and prompt transactions. I am told, on reliable authority, that in any portion of the United States a property may be transferred or interchanged in a few hours at the local office, after proper notice has been given, at a mere nominal cost. It will take us a long time in this country to arrive at such a sensible mode of dealing with landed property. It is generally acknowledged that facility of transfer or exchange would enhance the value of land 10 per cent., and, no doubt, from changing hands occasionally, it would be more likely to undergo improvement. We are also beginning to believe that it is as much to our advantage to well house our agricultural labourers as it is to well stable our farm horses. I believe statistics would show that more than three-fourths of all the miserable huts or tenements, occupied by our agricultural labourers, are owned not by the landowner, but by itinerant individuals, who only look to their rent, and have neither the inducement nor the inclination to initiate an amended shelter. Health, physical and moral, are thus alike sacrificed at the shrine of a neglect which is the parent of large poor-rates and a demoralised and deteriorated population. If all the evils and sorrows arising from bad water, damp undrained houses, and indecent propinquity, could be accurately ascertained and valued, a frightful sum total would be placed to the debit and cost of landholder and tenant. It is not in the labourers' cottages alone that reform is required, for many of our ancient farm-houses are fatally unhealthy. Built upon the bare, wet, undrained clay, water rises by capillarity up the walls (as it does in many of our churches); the result is a musty, clammy atmosphere in "the best room," and rheumatics or consumption among its inmates. I have seen the papering of the walls detached by the damp. Again, too often a moat of stagnant water surrounds the house, or it is shut in by dense foliage of trees, most injuriously to the occupants. The interesting fact that I am now, for the first time in my life, speaking upon agriculture in a Farmers' Public Library, in a country town, naturally suggests to me the question of our general education. Can any one present tell me how many Farmers' Public Libraries there are in the United Kingdom? I fear they might be counted on one's fingers; if so, honour and merit are due to the farmers of Faringdon for being foremost in the rank of intellectual progress. Here let me thank an intelligent Berkshire farmer, Mr. Spearing, for his able report on the "Farming of Berkshire," in the 21st volume of the Royal Agricultural Society's Journal. Education for our labourers will dispel the clumsy and costly ignorance which too often obstructs agricultural progress, and the rising race of farmers will have educational opportunities which were denied to their forefather. Thanks to my dear departed friend Richard Garrett, and many other good and wise men, the Suffolk Middle Class College will do wonders for the farmers of Suffolk; 300 boys, well-fed, lodged, and educated for £25 per annum, is, indeed, a boon, socially and nationally, for that example will soon be followed. But education has no value if it is not used. I too often see youths return to their farm from a good school, and find at home nothing to read, except perhaps the local weekly paper. Their learning becomes rusty for want of use, for it is painfully true that an agricultural library is rarely to be found in the house of the British farmer. A £30 note invested in Morton, Stephens, Caird, Rham, Liebig, Johnston, or, by annual subscription, the Journals of the English, Scotch, and Irish Societies, the "Farmer's Magazine," and other publications, would pay a large though indirect profit. For my own part, I am always a learner. Ignorance is not bliss even in agriculture; and I am pleased to see that the old cuckoo cry against "book" farming is gradually, though slowly, dying out. What can be more advantageous to agriculturists' progress than that they should meet "on paper," and there detail to each other the profitable or unprofitable results of their various experiments? The great secret of American progress is the general or rather universal use of education by the people. They have 120,000 public schools and colleges, where every person can be educated at free cost in a manner suited to his position. The Americans have always freely taxed themselves for these noble and useful institutions; and whenever a new district is populated, the first thing done is to provide ample lands and funds for the erection and endowment of the schools. Our good friend Mr. Howard told us, upon his return from America, that because the people are all educated they are all great readers. Long before ours, their cheap untaxed newspapers circulated to such an extent in proportion to the population, that although comparisons may be deemed odious, I am bound to say we are, in comparison, a most unreading set, especially in agriculture; and yet, from the nature of the farmer's occupation, he must have much more time to read than the townsman, whose late hours at the desk or counter militate against his opportunities for study. The mere reading of what is going on in other countries would enlighten our minds, stimulate our progress, and in some respects correct any over-estimate we may have formed of ourselves and of our doing. There is evidently great room for amendment in British agriculture, if it be true (which I believe it is) that our gross produce per acre is only £3 15s., and our capital only £4. My own capital is quite £15 per acre, and I must increase it with a view to enlarge my profits. Besides, a great deal of money is lost annually in farming. I will speak of amateur farmers by-and-bye, but I now allude to what are called practical farmers. On poor stiff clays and inferior soils, badly farmed, I see their capital wasting away under the influence of non-drainage, deficiency of capital, and the shortcomings of both landlord and tenant; and still they come, one after another, to be, as it were, swallowed up in the insatiable vortex of non-improvement. All this is very painful, and it is owing to my seeing these disasters that I feel impelled to endeavour to stimulate to a better state of things. As to amateur farmers (what a sentiment of glee I fancy must be felt at these words by some of my practical friends present), I am constantly hearing of their going into farming with high spirits, and coming out with melancholy pockets, and I will tell you why it is so. They do not consider that farming is an art—a business, in fact, that demands great practical knowledge, some of which can only be got by long observation and experience. Their expectations are often too sanguine, and when I tell them that £1 to 30s. an acre, or 10 to 13 per cent. for their farming capital, is all they have a right to expect, even with good management, they seem surprised. They often begin by paying too high a rent, and are "let in" by an over-valuation; and, unless they understand their business, or have an honest bailiff who does, they buy live-stock and everything else probably ten per cent. too dear, and sell their produce another ten per cent. too cheap. In the order and management of labourers and other things, there may again be a heavy percentage of loss. All this soon brings amateur-farming to a collapse. It is all very well for gentlemen to buy "pedigree" stock at fancy prices, but they must also sell their progeny at fancy prices too, or their "live-stock balance-sheet" will show an unpleasant result. They have to contend with men who have a rare eye for every point in an animal, and who will, by their superior judgment, almost create a pedigree stock. Instead of making 20s. an acre, they often lose 30s. or 40s. They should also learn most particularly to distinguish, in their investments, between permanent improvements and current farm expenditure. The former should be compensated by an increased charge for rental; the latter, by annual profit. Nevertheless, I know many intelligent, shrewd gentlemen, who, as amateur-farmers, have not only made it pay, but have, by their good example, raised the standard of farming of the district around them. In fact, we know that in farming, as in other arts, many of the greatest improvements have been introduced by non-practical men. No greater difficulty attends the amateur-farmer than that of getting an honest, as well as able, bailiff—one who can neither be corrupted by buyer nor seller, and who will devote himself entirely to his master's interests. Bad book-keeping, or too often no book-keeping at all, is in agriculture, as in many other trades, a great failing. I annex, as it may be useful, a copy of my accounts for the last two years, 1865 being a good crop and low price, and 1866 a middling crop and a better price. Although these years are by no means so good as many I have had previously, they will tend to dispel the too prevalent notion that Mr. Mechi's farming does not pay, and that it is the business in town that supports the farm. Without stock-taking, a knowledge of how much is owing to me, how much I owe, and how much cash is in hand at the end of every year, I should be "all at sea;" and equally necessary is it that I should know how the live-stock account stands, for that is the key of the position as regards the well-being and well-doing of the farm. A reference to my accounts will show that my farm-capital is about £15 per acre; that the rent I have to pay myself as landlord of my 128 acres, before I can claim any farm-profit, is 40s. per acre; and that, while I pay 20s. per acre for 45 acres of land adjoining mine, which I have since improved, my own land has been assessed by three eminent valuers at 40s. per acre rental, being 36s. for the land and buildings, and 4s. for the use of steam-engine and irrigating apparatus. My farm-profit is therefore 10½ per cent.—about £1 11s. 6d. per acre—on my farm-capital during these two years (they have been frequently much larger). A house, rent free, and some other conveniences, may be taken as another two per cent. I was a good deal amused when reading a recent paper on book-keeping, at the Croydon Farmers' Club. A farmer said he had lost £250 last year. "How about the living?" asked another. His reply intimated that he lived out of the farm, but did not reckon that as profit. What would bankers, merchants, manufacturers, and traders say to this? They would not endorse that theory, for too many of them know that "a living" is all that they can get, and sometimes a very hard matter to do that. My farm accounts show the actual produce, and the money received for it. What I buy off the farm for my own use I pay for at the price it would bring in the ordinary market. I would advise amateur farmers who have improved their land by drainage, &c., to have the improvements, when completed, valued, and the rent set upon the farm by competent valuers, just as if it was to pass into the hands of an ordinary tenant. This rent they would be bound to pay to themselves before they claimed any farm profit. This was my plan; indeed, it was imperative, because I was so frequently told that my improvements were no improvements at all, a statement rebutted by the valuation. I should also recommend gentlemen farmers to have a proper valuation of stock, crop, implements, tillage, &c., made every year by a competent public valuer; and if they found the farm did not pay, such a person might be fairly asked to give a report upon the causes of such non-profit. The cost of all this would be trifling, compared with its advantages. The live stock account should always be kept separate, as in my case, for it is too often there that mischief arises. I hope that my statement of accounts may prove useful. The question of capital in proportion to land is an important one. I have satisfied myself that less than £15 per acre would in my case be unsatisfactory. Imagine my having to farm three times the extent of my present holding with the same gross amount of capital, which would then be only £5 per acre! where would be my live stock, the very soul of the farm? As an average my live stock represents a capital of £6 per acre. I am afraid that the live stock capital of the kingdom has only a value of £1 10s. per acre, or equal to one sheep or lamb per acre on arable land. As an easy example of accounts, every transaction for cash should be entered in the cash book in detail, from which it would find its way to the ledger. I need hardly mention the necessity of a labour book, field book, and general journal of every-day transactions not entered in the cash-book at the time. Mr. Elliott, in his book, "Credit the Life of Commerce," quoted by John Stuart Mill, says: "It is not too much to say that one-half of the persons engaged in trade, even in London, never take stock at all; they go on year after year, without knowing how their affairs stand, and at last, like the child at school, they find to their surprise but one halfpenny left in their pocket. I will venture to say that not one-fourth of all the persons in the provinces, either manufacturers, tradesmen, or farmers, ever take stock, nor, in fact, do one-half of them ever keep account-books deserving any other name than memorandum books." I attribute the small amount of our national annual produce to a want of sufficient live stock; for if our recent statistics are dependable, our cattle, sheep, and pigs (reduced to sheep), would only give one full-grown sheep to each arable acre. This is evidently very insufficient as a manurial agent, and not more than a third of the quantity on my own farm, although I have so little permanent pasture. I have therefore three times as much annual manure as the average of the country, and my corn crops are benefited accordingly. In searching for agricultural knowledge I have been struck with the difficulty of obtaining satisfactory replies. For instance, if I ask "How many pounds weight of meat per acre do you produce over your whole farm, landlords' measure?" I can rarely obtain the information I desire. I make a point of not paying more per piece or per day than my neighbours do; but I almost invariably employ my men piece-work. The consequence is advantageous to me—it economizes time, diminishes the number of men, increases their means, and thus improves their physical and moral condition. I think there must be some exaggeration in the statements about agricultural labour. I find that each of my men earns £35 per annum, independent of the earnings of their wives and children, harvest gleanings and beer. Farmers suffer materially by day-work, lose many opportunities, and keep their men in a low physical condition. Manufacturers have no such weakness. My men have free access to small beer. (One bushel of malt to the hogshead) and the occasional pint of stronger. At harvest they have six pints of best beer (four bushels to the hogshead). My farm beer costs about £20 annually, or 2s. 4d. per acre, or about 1s. per week for each labourer. One of the most important causes of success in agriculture is to *adapt your crops and animals to the climate and soil.* An infringement of this natural law is sure to be attended with loss. I remember that a main part of the loss in my famous balance-sheet (1851) arose from having a large breadth of potatoes (27½ acres), tempted thereto by the success of a similar cropping on the Auchness farm. Potatoes love a humid climate and a friable and calcareous soil. In our stiff cold, non-calcareous, ferruginous, collapsing clays we are safe with beans, mangels, cabbage, clover, wheat, and oats; but we must leave barley and turnips to lighter, warmer, and more calcareous soils, and permanent pasture to a more humid climate, or to the borders of streams. The recent agricultural census is instructive in this respect. We there see that humid and mild Ireland has of her corn and root crops—

Per cent.	Per cent.
78·1 oats	70·9 potatoes
13·8 wheat	21·0 turnips
7·0 barley	——
——	91.9
98·9	

Scotland:—

Per cent.	Per cent.
73·5 oats	72·2 turnips and swedes
15·6 barley and bere	21·6 potatoes
8·1 wheat	——
——	93·8
97·7	

Wales:—

Per cent.		Per cent.	
48·3	oats	44·8	turnips and swedes
28·1	barley	31·8	potatoes
21·8	wheat		
98·2		76·6	

England:—

Per cent.		Per cent.	
42·7	wheat	58·2	turnips and swedes
25·4	barley	11.3	potatoes
20.3	oats	9·2	mangels
6·7	beans		
4·2	peas		
99·3		78·7	

Many sanguine persons, who bring over to this country seeds of luxuriant foreign plants, do not consider the difference in climate and soil. Cobbett tried in vain to acclimatise maize, which requires a high temperature and abundant moisture. One can easily comprehend that hair-covered animals are better suited to a wet mild climate like Ireland than woolly animals. Hence, we find by the census that Ireland has 3,742,932 cattle, and only 4,270,027 sheep; while England has only 3,420,044 cattle, but 15,124,541 sheep. For the same reason Ireland is superlative in pigs. The difference between landlord's measure and the actual available space is so considerable, that I hope, in future statistical returns, we shall get a statement of the space occupied by fences, by homesteads, by roads and waste—all this is charged with rent, although no return is derived from most of it: I think it adds quite 10 per cent. to the rental. In my own case, after removing all internal fences, the loss of space is quite 5 per cent. If the area of the United Kingdom is 77½ millions of acres, and the recent returns only account for 44 millions, can it be that nearly one-half of our land is unavailable for production? Ought we not to know how these extra 33 millions of acres are appropriated? It has been stated on good authority that one-half the land of England is owned by only about 150 individuals, while one-half Scotland belongs to only 12 owners. If these estates are all entailed it must certainly somewhat restrict a great investment in improvements, although a recent Act of Parliament enables owners to charge their entailed property with a certain amount annually for improvements. Some great estates are very admirably farmed. The recent agricultural statistics show that we have still in Great Britain (leaving out Ireland) 964,937 acres, or 1,200 square miles of land cultivated but uncropped. Is this necessary? I reply, certainly not, provided there is a sufficiency of live stock or manure. When I take two heavy wheat crops in succession, or wheat, beans, and wheat, I am asked, "Ah! but what do you do after that?" I reply, "Rest the land by taking 30 tons of mangel per acre." This is the fact, and it is simply a question of plenty of manure, deep cultivation, and ample horse-hoeing. I speak of my own poor heavy land. The land may be kept clean by proper cultivation without a long, unproductive, and costly fallow. Chambers of Agriculture and a Minister of Agriculture are now strongly advocated. On the first there can scarcely be a doubt as to its necessity and utility. The latter, I think, must be given up, for, if carried, we must also have a minister for commerce, another for manufactures, trade, shipping, &c. A department of the Board of Trade and Agriculture would do all that is required. While many absurd restrictions in leases might be dispensed with, we rarely see one most important duty enforced, namely, that the mouths of the drains and ditches into which they discharge themselves should be kept constantly free and open. I have witnessed such culpable and suicidal neglect in this particular that I am induced to allude to it. Whenever a spring drain gets choked by a water-plant or roots of a tree or shrub, it should at once be attended to, or an extensive area may be damaged, for water will head back in the land for miles by such a stoppage and neglect. Arable or grass land is a question which is much discussed when wheat is cheap and meat dear, but it must be determined by soil and climate. On our stiff Essex clays, under a dry, hot, cereal climate, pasture should be the exception, arable the rule. Out of 170 acres that I farm, I have only 14 acres of permanent pasture as a run for my breeding stock. So much of our heavy tile earth contains iron and no lime, that the grasses produced on it have no fattening quality, while the quantity is small. This is what makes me somewhat doubtful about the Buscot pastures. Irrigation, natural or artificial, very much alters the case. It is better, therefore, on such soils, to grow clovers, tares, mangel, and beans, the latter making excellent summer green food. On such soils I have this year realized £21 per acre in wheat and its straw, and £14 per acre in beans, and £12 in oats (besides the straw), where we should only have obtained £5 to £7 in grass or hay. Ireland, with its mild and humid climate and limestone formation, is essentially a grass and potato country. Its cereals should be oats. Cornwall, Devonshire, Somersetshire, and all the western side of our island, whose hills arrest and condense the warm Atlantic clouds, are much better adapted for grazing than our eastern coast. It could scarcely be believed in our eastern counties, where the rainfall is under 20 inches annually, or 2,000 tons per acre, that as much as 180 inches (18,000 tons per acre) have fallen in one year at Seathwaite, in Cumberland, where the average is 127 inches. The general mismanagement of our grass-lands is notorious; they are starved and robbed, instead of being well manured, and in that state are best broken up for corn growing. Grass-land is easily improved by ample cake and corn feeding, artificial manures, and by hoeing and spudding out bad grasses and weeds, and sowing annually or occasionally good grass-seeds and white clover. There is nothing, however, so remunerative or nutritious as Italian rye-grass, provided it is irrigated with sewage. After two years of such treatment, the land is in first-rate order for pulse and then grain crops. In the management of our farm we have often considered the question of laying down to grass, and have satisfied ourselves that our present mode of management is by far the most profitable. Plenty of well-fed stock, some purchased manure, and maximum crops of corn and straw, as well as of roots, pulse, clover, and tares, are best suited to our soil and climate. Twenty-four years ago, when I first insisted on the propriety and profit of a national economy of our voidances, I almost despaired of its being carried out in my time; but great changes have come over the public mind, and false delicacy has succumbed to common sense—witness the Sewage Congress held lately at the fashionable town of Leamington. The profit of such an economy is now no longer denied. Our towns and cities will require, and no doubt obtain, Parliamentary powers for the purchase of lands for the purpose of sewage irrigation, and then let them at improved rents. I hope that the great company forming to apply the sewage of the northern side of the Metropolis to agricultural purposes may meet with success. Already they have made a beginning, on rather a large scale, so that the farmers through whose lands their great tunnel will pass (being practically convinced) may tap its contents, and turn them to profitable account. Had they my practical experience of 18 years in this matter, they would hasten eagerly to apply for such a boon. I am glad to know several large farmers who are looking forward to use it extensively. Our country ought to be constantly improving in fertility, for we not only consume all we grow, but also devour untold millions of foreign produce, solid and liquid—I believe to the worth of £70,000,000 annually. Surely the life-blood of the nation will no longer be permitted to rush in wasteful streams through our sewers to poison our rivers and ourselves. I was very much struck when in Scotland by the enterprise of Scotch farmers. It is no uncommon thing to see a tenant, at the commencement of a lease of 19 years, investing some £10 to £15 per acre on drainage, liming, and other improvements. No doubt it is the lease that gives him, and those who aid him with capital, confidence of a profitable return; but beyond this, there is the intelligence resulting from a better education than is customary further south, and an appreciation and exercise of this education. This remark will apply also to the farm servants, labourers, and shepherds, who can all read and write. A southerner wonders how the Scotch can pay such high rents; but they waste no land in hedge-rows and ditches, small fields, and timber. Scotch farmers, used to a moister climate than ours, do not always succeed so well south and east. They complain, justly, of the want of intelligence in our labourers, and of insufficient house-room and accommodation for both man and beast. My Scotch friends are appreciating more and more oilcakes as feeding substances, and no longer scold me for recommending plenty of cake-feeding as a sure means of growing plenty of corn. Before I come to the conclusion of this long paper, let me entreat you to consider the unfortunate position of those unhappy farmers whose £3,000,000 worth of cattle have been swept away by dire disease. The Royal Agricultural Benevolent Institution presents a medium for some alleviation of the misery resulting from such a dreadful calamity. The results of agricultural improvement are cheering, individually and nationally. They increase the landlord's rent, the farmer's profit, and the food of the people. They elevate us in influence and position. The whole neighbourhood is benefited, machine and implement-makers thrive, the shop-keepers and tradesmen find their receipts and profits enlarged; but, above all, there is a great increase in the employment of labour. Not only does this take place in the drainage, building, &c.; but the permanent labour on my farm is doubled, although I use steam-power and machinery. Other evidences of progression and improvement are exhibited in a new and newly-endowed church, a rectory, and school. A small dissenting chapel has been rebuilt on an enlarged scale, new cottages have been built, and the physical, moral, and religious condition of the population considerably improved. I am now 65 years of age—my time is getting short. When it pleases God to call me, I shall, on my last pillow, be comforted with the conviction that my efforts to benefit my follow-creatures, as well as myself, have not been entirely in vain.

	Paid.	Paid.
Jan. 1.—Valuation :—	1865.	1866.
Live stock	£827 12 0	£1144 10 0
231 fowls	20 0 0	20 0 0
7 horses, 1 donkey	124 0 0	154 0 0
Tillages, manure, &c.	472 10 9	501 18 4
Hay, corn, &c. (unsold)	286 4 0	252 18 0
Implements	435 11 6	430 0 0
Fixed steam-engine and irrigation pumps, &c., valued in estate ...		
Corn and hay for live stock, produce of farm charged at market prices	301 2 0	188 14 0
Corn, cake, malt-combs, bran, &c., purchased for live stock	369 7 0	418 3 7
Grinding corn for live stock by our own engine at the usual prices charged to others	25 15 10	16 0 0
Sundries for live stock	7 19 0	4 4 0
Veterinary	1 12 6	0 0 0
Medicals	2 16 0	1 15 0
Live stock purchased	281 0 0	185 15 11
Plough horse purchased	47 12 6	15 15 0
Horse food purchased from farm	114 0 0	105 16 0
Ditto purchased elsewhere	15 0 0	42 1 0
Farm labour, including engine-driver and working-bailiff	386 16 11	353 12 5
Rent of chapel land, 45 acres ...	45 0 0	45 0 0
Tithes, taxes, poor, highway, church, and county rates	82 4 5	84 2 7
Allowed for wear-and-tear and depreciation of machinery and implements	25 0 0	25 0 0
Coals for steam-engine	51 10 0	31 7 11
Tradesmen's Bills: Wheelwright, blacksmith, founder, harness-maker, bricklayer, carpenter, painter, basket-maker, cooper	57 8 0	41 8 11
Malt and hops for beer for labourers	22 0 0	21 9 6
Purchased seeds and plants	33 1 4	28 15 9
Ditto of our own growth	29 7 0	42 19 0
Purchased manures	110 17 10	78 0 0
Ditto straw	16 8 0	6 0 0
Miscellaneous petty expenses: Mole and rat-catching, mending sacks, postage stamps, stationery and farm account books, oil, candles, cart-grease, tallow, packing for engine	8 1 10	5 10 0
Thatching	7 15 0	5 9 0
Thatching stuff	1 2 0	1 0 0
Corn-blowing machine		1 1 0
Sheep troughs		2 10 0
	£4208 15 5	£4255 16 11

	Received.	Received.
Dec. 31.—Valuation :—	1865.	1866.
Live stock	£1144 10 0	£854 6 0
Poultry	20 0 0	30 0 0
Horses and donkey	154 0 0	130 0 0
Tillage, manure, &c.	501 18 4	489 7 8
Corn and hay, &c., unsold	252 18 0	636 12 6
Implements	430 0 0	425 11 6
Corn sold for money	601 5 10	478 19 9
Corn and hay sold to live stock as per contra	301 0 0	188 16 0
Peas (for picking) sold	44 0 0	2 0 0
Home-grown corn used as seed and charged per contra	27 2 0	42 19 0
Oats, beans, and hay, home-grown, sold to our horses, and charged per contra	114 0 0	105 16 0
Hay sold	72 17 0	10 2 6
Mangel roots and seeds sold	39 17 6	91 10 3
Meat sold	813 1 0	1123 7 11
Wool sold	19 10 0	54 1 1
Poultry and eggs sold	44 10 9	43 15 0
Grinding for hire	73 15 4	32 5 3
Grinding for our own stock	25 15 0	16 4 0
Milk and butter	11 5 0	12 0 0
Rent of cottages	15 17 0	15 17 0
Dead horse		0 15 0
	£4707 2 9	£4784 8 5
Paid	4208 15 5	4255 16 11
Balance for rent of 128 acres and profit on £2,500 farm capital.	£498 7 4	£528 11 6

Live Stock.	Paid. 1865.	Paid. 1866.
Jan. 1.—To valuation of bullocks, sheep, pigs, and poultry now in hand	£847 12 0	£1164 10 0
Hay and corn purchased from our own farm at market prices ...	301 2 0	188 14 0
Corn, cake, malt-combs, bran, &c., purchased elsewhere	369 7 0	418 3 7
Grinding corn by our own engine	25 15 0	15 0 0
Veterinary medicine and sundries	12 7 6	0 0 0
Live stock purchased	281 0 0	185 15 11
	£1837 3 6	£1972 3 6

Live Stock.	Received.	Received.
December 31—	1865.	1866.
Meat sold	£813 1 0	£1092 9 11
Wool sold	19 10 0	54 1 1
Poultry, eggs, &c., sold	44 10 9	55 15 0
Valuation of bullocks:— Sheep, pigs, and poultry in hand.	1164 10 0	884 6 0
	£2941 11 9	£2086 12 0

Capital Account.	Dr.	
Dec. 31.—Sundry unpaid accounts owing by the farm		
Farm capital:—	Cr.	
Valuation on the 31st December		£2561 17 6
Cash in hand or at banker's		
Outstanding unpaid accounts owing to the farm.		

Apportionment of Farm Capital.	
Live stock	£6 0 0
Horses	1 0 0
Tillages	2 10 0
Implements and machinery	2 10 0
Hay, corn, &c., unsold	3 0 0
	£15 0 0

My Annual Course of Cropping.

	1865. Acres.	1866. Acres.	1867. Acres.
Wheat	42	55½	56¾
Barley	12	12¼	11
Oats	14½	12	7½
Beans	17½	6½	13½
Peas	8	8¼	17
Clover	13½	20½	12¼
Permanent pasture	14½	14½	14½
Sewaged Italian rye-grass	12¼	12	12
Mangel-wurzel	16¾	10½	9
Cabbage	3	1	1
Winter tares for feed	6	6	4
Carrots	—	1	½
Swedes	—	—	1
Available acres	160	160	160
Cabbage after tares, second crop, same year	6	3	5
White turnips and rape after peas, second crop	8	8	6
Swedes after tares, second crop	—	3	—

Available acres	160
Fences, ditches, and road	5
Ditto on my own farm	7
Buildings, stack yard, &c.	2
Private house, garden, and shrubberies	3
Total landlord's measure	177

Where white turnips are taken after, the peas are removed directly they are cut and made on another field. This gives more time for turnips.

In 1866 the live-stock left about £6 10s. per acre for the root and green-crops consumed, after paying for all purchased food. In 1866 they only paid £5 per acre, because corn, cake, &c., were all dearer than in 1865, although meat was, if anything, rather cheaper. The labour attendant on stock is charged in the general labour account. If it and the engine-coals, &c., were charged to the live-stock account, very little would be left for the green and root-crops; and yet I consider it is this great consumption of purchased food, and consequent manure, that makes the farm pay: without it, it would not pay. The tillages comprise the cultivation, seeding, and manuring. Our preparation for the mangel-crop, including rent, &c., costs about £12 per acre. Beans are also well manured; so are cabbage. The land for mangel and cabbage is always deeply trench-ploughed after being manured. The preparation for mangel is always before Christmas. Wheat is manured for with two cwt. of guano and some salt, when taken after beans, roots drawn off, or wheat. Peas are taken after two years' Italian ryegrass. White turnips, on the light land, are fed off early, and followed by either wheat or barley. Fourteen hundred loads of good rich manure were produced on the farm last year, and applied to the soil. At present we see no mode of farming this land likely to be more remunerative than our present system. Much straw is used as food, cut into fine chaff, and mixed with pulped roots, ground corn, rape, linseed or cotton-cake, malt-combs, and bran. Our farm-horses have all their food prepared and comminuted. They are rarely turned out, except sometimes at night during harvest. The practice on my farm is based upon the theory that the growth of corn and other agricultural products is made to depend upon the making of meat. There is a great advantage in this system; for when corn is at a low average price, I sell it to my live-stock, and thus increase my store of manure; and thus, *pro tanto*, prevent overstocking the corn-market. Last year, when Revett wheat was only 36s. per qr., or 1s. per stone of 14lbs., I ground it up for my bullocks, mixed with other substances. This year, with the same wheat selling at 55s. per qr., I sell it to the miller or factor, because, meat being rather cheaper than last year, it would not answer, at such an improved price, to consume it. The same remark holds good for barley. We invariably consume all our beans and oats—sell them, in fact, to our stock. This high system of farming keeps the land always ready for a good breadth of wheat, when it is clear, and forces maximum crops at all times. I entirely dissent from the modern theory that we must make meat only, and depend on foreigners for our wheat. On the contrary, I grow more wheat and make more mea concurrently. This I have proved to be a sound and profitable practice. The foregoing live-stock balance-sheets confirm in a remarkable degree my celebrated live-stock balance-sheet, that created such a furor in 1851 (see p. 188 of my book). They prove that, if you charge the live-stock account with the cost of green and root-crops, attendance, labour, interest of capital, rent for shelter, in addition to the purchased food (as was all done in the 1851 balance-sheet), the live-stock accounts will show a considerable loss. In the present balance-sheet these expenses are charged in the general farm account. That live-stock account was almost as favourable as my recent ones, taking into account the enormous quantity of purchased food. The wisdom of those large investments in purchased food is confirmed by the very much greater consequent yield of every crop.

THE MEETING OF THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

A deputation from this society, consisting of Mr. Tremayne, the President, Sir J. T. B. Duckworth, Bart., Mr. T. D. Acland, M.P., Mr. Neville Grenville, M.P., Rev. T. Phillpotts, Dr. Lush (Mayor of Salisbury), Mr. H. Fookes, and others, had an interview with the Lord President of the Council on the 21st April, for the purpose of ascertaining whether the society would be permitted to hold an exhibition of stock at the Salisbury Meeting, in June next. The Lord President listened most attentively to the arguments adduced in favour of holding a complete show, but eventually gave the deputation to understand that a deputation from the Royal Agricultural Society of England would be received by him on the following Monday, and the question would have to be determined on imperial grounds, and not with reference to any particular society. Meetings of the Privy Council on matters connected with the cattle plague have, during the last fortnight, been very frequently held, and it was hoped by the Council of the Bath and West of England Society that, at an adjourned meeting of their body on Saturday last, some authoritative communication would have been received from the Privy Council on a matter of great interest and importance to agricultural societies generally. From private information received by the Secretary, it transpired that, at a meeting of the Committee of the Privy Council on the previous day, so many matters of importance had to be considered and determined, that it was impossible, until the following Monday, to entertain the question with reference to the permission to hold exhibitions of horned cattle during the current season. Under these circumstances a motion was brought forward by Captain Tanner Davy, and seconded by Mr. J. W. Sillifant, that it is inexpedient to hold an exhibition of horned cattle during the present year. A long and important discussion ensued, incidentally to which letters were read from well-known breeders and practical agriculturists in the western counties, pledging themselves to send their *best* horned cattle, if an entire show were permitted; and eventually, on the motion of Colonel Archer, seconded by Dr. Brent, it was resolved, by a very large majority, "That, in the event of the Privy Council giving permission to hold an exhibition of horned cattle at Salisbury, the Council feel that they are bound to keep faith with the public and to hold an entire exhibition." Whatever the decision of the Privy Council may prove to be, it will thus be seen that the Bath and West of England Society, who last year, notwithstanding the absence of live stock of any kind, had a most successful meeting, are resolved, as far as possible, to carry the forthcoming meeting to a triumphant issue; and, if it should unfortunately occur that horned cattle will not be permitted to be shown, the Council will, with full confidence, fall back on a great show of sheep, horses, pigs, poultry, agricultural implements, and horticultural specimens, which may be almost regarded as the specialities of the district in which the forthcoming meeting is to be held. As a proof of the interest already excited, the Great Northern Railway Company, the Midland, the Great Western, Bristol and Exeter, Devon and Cornwall, Somerset and Dorset, and other Railway Companies, have already entered into liberal arrangements for the conveyance of stock and implements, and it is confidently expected that the South Western Company will concur in the same liberal policy.

THE HERDS OF GREAT BRITAIN.

CHAPTER LIII.

THE ELMHAM AND BROME HALL.

"Get rid of your Norfolk sheep," was a great saying of Mr. Coke's. Few would doubt its truth, if they had wended their way as we did last autumn to Elmham from Titteshall Church—that Westminster Abbey of Norfolk, where the honoured dust of the fathers of English law and agriculture lie almost side by side—and paused at Briseley Green. It is a most tempting place for a race-course; and, in fact, a few enterprising "mud students" did once cut down the thistles, and hold a meeting there, with a capital run-in under the elms; but the only racing specimens left on the soil now are the "old Norfolks." We have seen sheep in every part of Her Majesty's dominions from the Shetlands to Land's-End; but these flat-sided and leggy "old hornies" were the strangest yet, and we at last comprehended why the boy Jonas Webb should have "lost leather" by riding them in his father's Steetley-Hall barn, and determined to breed sheep with better saddles in the years to come. The Briseley "commoners" seem to have had an especially hard time of it, and the shade of Denney of Egmere would have disowned them. "This time next year they'll be a year older," was the most satisfactory reply we received as to their feeding powers; and our companion spoke still less hopefully when we consulted him on the constitution of some September-hatched turkeys—"They'll never be eaten; they'll not live long enough."

But the long line of Elmham Wood was before us, and a few minutes more brought us into the Park, to whose sheep and cattle groups two retired phaeton whites, such as Herring loved to drive and draw, lent no small life, like the Stumps mares at Sledmere. The Park contributes nearly 300 acres to the pasture of the Home farm, of whose 700 fully a half is in arable. Four hundred Southdown ewes feed on it from tupping time at Michaelmas till within a fortnight of the lambing; but it is rather too good for sheep, and more adapted for bullocks. The arable ground is chiefly reclaimed heath, and bears its part in wintering about 1,000 Southdowns and 100 cattle. Woods and gorse have all yielded to the axe and plough, and many a fox has been found on the Heath Farm, on whose wheat stubbles Stearn's sort, "well ringed," were now busily "shacking." The land is clayed every twelfth year; but the yield is not quite in proportion to the straw.

Crossbred sheep by West Dereham or Marham rams from Hampshire and blackfaced ewes form the great staple of the Norfolk sheep-folds. The only pure Southdown flocks in the county are to be found at Lord Walsingham's, Lord Sondes's, Sir Willoughby Jones's, Sir Wm. Ffolkes's, the Messrs. George, Mr. John Sewell's of Pickenham and his landlord Mr. Applethwaite's, and one or two others. H.R.H. the Prince of Wales has also introduced them at Sandringham, and takes rams, like all the above, bar Lord Walsingham and Sir Willoughby Jones, from Elmham, which also furnished his first fifty ewes. Mr. Henry Overman has left his father's "small in size but great in value" love to breed Oxford Downs, and to some purpose, as a Royal and a Smithfield Club first can prove. The Elmham flock dipped very largely at one time into the Overman rams, and went some sixteen years since for a change of blood to Babraham. A ram from Lord Radnor's and one from Sir William Throckmorton's have also been used, and three or four from Messrs. Heasman of Angmering. About ninety ewes are drafted each year, and a hundred shearlings put into the ewe flock. Forty ram-lambs are generally kept for use or letting as shearlings; about 140 wether-lambs and 80 ewe-seconds are sold by auction the first week in September; and 100 shearling ewes and 80 broken mouths make up the annual draft. On the occasion of the Hamburg Show in 1863, eighty shearling ewes and twelve rams were shipped, and all found customers. Herr Zoepritz, well known on the Continent as the Jonas Webb of Germany, has been a pretty constant customer since 1860; and a lively trade with the North of Prussia, Sweden, and the Finnish provinces of Russia was springing up, when the rinderpest sealed the ports against live stock. A few sheep have also been recently sent to the United States. For more than ten years the flock has been shown locally, but it has never yet tried its fortunes at the Royal, and reserved its strength for Christmas. It was first represented at Birmingham in 1866, and at Smithfield in 1864, and it has scored one first, three seconds, and one H.C. entirely in the shearling classes, besides three silver medals in the extra or "all and sundries." Its greatest achievement was in 1865, when it took the Smithfield Club silver cup for the best pen of Southdowns, against Lords Walsingham and Radnor, with a twenty-month pen, which averaged, before leaving home, 231½lbs.

About ninety acres are generally in green crops. Green Round turnips are the portion of the ewes, while the tegs get swedes; and they are half drawn off, half fed on the land. The tegs have a great deal of artificial food with their swedes, such as malt dust, bran, and cut hay, and, in fact, eat nearly as much dry as green stuff. Twenty acres are devoted to late-sown turnips, and twenty acres to rye, which is a stolen crop sown on wheat-stubble, and "nicks in" when the turnips are finished, the first week in April. This, with park feed, and some mangel, and a little cotton cake, forms the almost unvarying routine, in which rape finds no place. There is no regular lambing yard, but it is shifted each year, and the yard, which is always built for about 120 pens, is snugly sheltered by whins and faggots woven into a six-foot paling. "The training stables" are in the dainty meadow behind Mr. Fulcher's, where stands the ancient dovecote, tenanted by nothing but blue rocks. A ram of the "old blue blood" from Mr. Henry Webb's was there, awaiting the toils of the season; and fourteen shearling wethers were in preparation for three pens, whose ultimate lot it was to divide Lord Walsingham from Earl Radnor and Mr. Foljambe respectively, in two classes at Islington; and Earl Radnor from Lord Walsingham at Birmingham. Still "the sheep of all sheep" was the the future Smithfield silver-medal ewe. She was a two-shear maiden, and very nearly of pure Overman blood. For perfect shape and character she has hardly ever been excelled, and she measured eleven inches between the fore-legs, and four feet two inches in girth, or only one inch less than the best of the shearlings. The ewe had been previously shown as one of a pen of five first prize shearlings at Norwich, one of her sisters won the same medal at Smithfield, in 1865, and another took a prize at Riga. We could get no higher in the Southdown scale, and we turned to the cattle in the park.

Lord Leicester and Mr. John Bloomfield are now the only county breeders of Devons. Lord Sondes, although strongly urged to do so, never cared even to try a cross between them and a Norfolk bull, and only a few are bought in as work bullocks and to feed off. "A blood-red dairy" of Norfolks and Suffolks has been associated with Elmham as long back as Mr. Money Griggs, who is the oldest tenant on the estate, as fond of his saddle and a little foxhunting as ever, and a guest at seventy-nine audit dinners without a break (beginning as a lad of seventeen in 1788) can possibly charge his memory. The herd numbers during the winter some seventy to eighty of all ages, and there is generally a fall of about a score of calves each year. There is a ready market for bull-calves at nearly 20 gs. each, and in 1865 two bulls and six cows and heifers were sent to the Viceroy of Egypt. Sir Edward Kerrison and Sir Willoughby Jones have both had stock from Elmham, and the Duke of Bedford's agent also purchased some for the Woburn dairy, when the Herefords were kept entirely for nursing the calves. The Norfolks are allowed no such privilege at Elmham, as the calves are only with them a-week, and then go on to skim-milk. Original Norfolks may have been dun and horned, as the old village signs of the "Dun Cow" and the picture in the steward's office at Holkham would go to prove; but we found none of that colour here, and none of those flecked or roans which some have held to be orthodox. As to their Scotch origin there seems no doubt; and one of them in the park, by a George bull, might have well passed for a Galloway in red. In fact, Norfolk and Suffolk seems to fall quite naturally under the head of Angus and Galloway respectively, if we put milking out of the question. The Norfolk has the finer head of the Angus, and lays its ears back like a vicious horse, in the style of Mr. M'Combie's Old Charlotte and her daughter Pride of Aberdeen.

For a really clean chiselled head, nothing can exceed a high-bred Norfolk cow. The nostril and the inside of the ear should be yellow, and the eye very full; but the two first features are not exactly regarded as butter-marks. As a general thing, they are a little lacking in size, but darker in colour, and with more arched ribs—a point on which the old sort was deficient—than the Suffolk. The latter is a somewhat coarser breed, with larger offal, and shows its Galloway lineage by fringed ears, standing more out at an angle from the head. They are very deep-sided, and at times a little too much of that inverted horse-collar shape which Bakewell detested, and wrote against so much in his diary. Some of the Suffolk men contend that the Norfolks are below the Suffolks in milking qualities; but Mr. Fulcher does not agree with them, as the best Elmham cows will give their pail or ten quarts twice a day for six or eight weeks after calving, and will milk all the year round if allowed to do so, and the cow of a tenant has been giving very much more when in profit. From a dairy statement of a farmer, in a parish adjoining Elmham, we find that the butter made from thirteen red polled Norfolk cows, and sold at Norwich, which is not a very high-price market, has averaged £12 6s. 8d. per cow for four years, and there was also milk and cream for the family. It has been a great object at Elmham to go for hair as much as possible, and if any of their own or the purchased heifer-calves come with black noses, they are always spayed. The tempers of both sexes are very nice, and the faults which breeders have to struggle with, are coarseness on the tail head, a lightness of thigh and hind-quarters, and a tendency to throw back to the original dip in the loin. The cows cross capitally with a Shorthorn, and the heifers of that cross invariably come without horns. London butchers rather prefer a heavy Scotch black, if it has "slugs", but the Royal Agricultural Society intends to disqualify the Norfolk or Suffolk which shows any trace of them at Bury. Norfolk steers well kept will scale at 2½ years 50 to 60 stone of 14 lbs., and the butchers consider them excellent provers. They have not to meet Galloway bullocks as they once did on October 17th, in the wheat stubble at St. Faith's, which like many other fairs has come to nothing, since the rail made the "Norwich Hill Saturdays." There are about sixty regular herds of this sort in the county, and Mr. George, of Eaton, near Norwich, is quite the oldest breeder. "George's get red calves out of anything" is quite a herdsman's saying, and Lord Sondes has used bulls of the blood most freely. Mr. Badham also took bulls from Mr. George, and Red Jacket, one of his breeding, was as fortunate a bull as ever came to Elmham. He was a great and good one, and therefore worthy of a name, a distinction which comparatively few of these bulls or cows arrive at, as no adventurous East Anglian has cared to commence a Herd Book. The Elmham has, however, had "its own gazette," not only in the annals of the local meetings, but in those of the Royal Agricultural, from which for the last eleven or twelve years its beasts have never returned without a prize. Of these prize-takers, a short-legged, light, dapple cow was pointed out to us in the park, as "the second Newcastle cow," quietly licking the first winner, a cow of much more scope and with a great deal of Angus character. One of her daughters was also there, and especially noticeable for her clean and expressive head. The matron of the herd was of the Cherry sort, and rising eighteen; and another with wide hips and dating from the herd of Sir Edward Kerrison's father, illustrated the old type, as they stood under the oaks and chesnuts in that pleasant park upland.

We had no time to seek Mr. Simpson's paddocks, and spend an hour for old acquaintance' sake with Vedette and Promised Land, but pushing away from Diss Station across the common of Eye Lordship, a sort of political union of ten parishes, we soon reached Sir Edward Kerrison's farm at Brome Hall. The history of the first Oakley farm herd might be read in the paintings round the parlour walls of Mr. Horn, the farm-bailiff, who hails from Aberdeenshire, and has had, as his lectures at the Eye Farmers' Club go to prove, a very varied experience both north and south of the Tweed. There hung the bull, cow, and heifer which won at Windsor in 1851; the two years and eight months heifer of ten years before, with an old family herdsman in a red waistcoat at her side; a prize cow of renown in the olden time, high behind, and dipped in the loin; and the Cambridge Royal prize yearling bull of sixteen months, with a good allowance of white both on the tail and below. Most of them are of a lighter red than the cattle of the present generation, and with the above exception they have no tendency to be "sparky." Pigs have always been made a great point of on the farm, and two of them, one fed up to high-pressure at ten months, and the other of the same age and left pretty much to nature, stand together in ludicrous contrast on canvas. Sir Edward still keeps to the small white sort, and within the lineage lines of the great W Quadrilateral—Windsor, Wainman, Wenlock, and Wiley—combined with a dash of the Radnor. The twelve to fourteen breeding sows are always out on the meadows all summer; and there is no lack of demand for the young sows and boars, which such a mode of treatment brings in abundance.

The home farm has 400 out of 700 acres in pasture, and with the exception of the Shorthorn Violet 3rd, the two dozen dairy cows are all Suffolks. The private prize-sheet shows that Brome has never abandoned Shorthorns entirely, and between 1859 and 1866 it has taken eight first prizes,

&c., at the Norfolk and the Suffolk shows, principally for cows of the breed. A short interregnum between the first and second Suffolk herds was filled up by Ayrshires; but the plague of flies in summer and the cold east wind from the coast did not suit them, and they had to give way to the natives in '59, six years after the late baronet's death. The foundation of the second herd was laid by the purchase of some females from Mr. Mosely, of Glemham, and Mr. Woolton, of Newbourne, but none did better service than two heifers and a cow from Mr. Oliver, of Dorking. They were crossed principally with Oakeley, a bull of the old Oakeley stock and purchased from Elmham, and the great object has been steadily adhered to, of "trying to combine Norfolk flesh with Suffolk milk." The cows only suckle a calf when it is from a favourite, or more than usually promising; and the mere "platers" are taken away as soon as they are dropped, and reared for the first week on sweet milk, and after that on milk and linseed gruel.

The sheep were once all Southdowns, and they were succeeded by Cotswolds, which gradually lost size and constitution; although the cross with the Hampshire produced capital lambs, which fetched from 40s. to 50s. early in September. A pure Southdown flock is in residence once more; and the foundation of it was laid with five score ewes from Mr. Turner of Chyngton, as many shearlings from Lord Walsingham, and a score of his lordship's best "crones" of 'sixty-six. Clovers, as a general thing, answer much better than grasses in this climate; and meadows on the lighter soils are renovated with white clover and rib-grass for sheep, while perennial red clover supersedes the latter upon the heavier ones. Mangel wurzels produce a good tonnage per acre; but the swedes have not done so well as the Aberdeen yellows and Green Rounds.

The cart stable is tenanted by about two-and-twenty Suffolk chesnuts, sixteen of them mares. From nine to ten foals are dropped each season; and the drafts are sold at two years old. Brag, the Worcester prize mare, by Royal Duke, or rather Catlin's Duke, is a great feature of the farm, and has had three or four very good foals. She was our principal goal; but our first visit was paid to the pretty model dairy. The roses and nasturtiums were clustering on its trellisses; and inside we found our old friends the Swiss milking stool, cow-bells, and trappings, which hang there as a memorial of Battersea, and of the *Ranz de Vaches,* which that patriot herdsman sounded so perpetually (for a shilling down), in honour of the land of his nativity. The pantiles and the China blend pleasantly with the oval milk-pans of blue and white pot—a happy compromise in shape between elegance and utilization of space; but the American churn has not fulfilled what Brother Jonathan vowed in its name; and "butter in five minutes" proved, after the fairest and most energetic trials, to mean "*butter in* 20½." The cool and nicely-arranged cow-byre, with its chocolate doors and sides, and its more sombre slate-coloured interior, relieved here and there with an orange or red rosette and cards, which told of "*Brandreth Gibbs,*" was deserted on that bright October afternoon; and as we pass the sties, the floors of which are of spars upon bricks, the name of "Annie Laurie" strikes on us once more. That Punch-sung sow has, however, been condemned and executed for fat, but she left three litters behind her. Lady Jane, a combination of her blood, which was half-Wenlock already, with Wenlock again, is there with her second litter; and from her we thread our way past the covered yards into the meadow behind. Violet 3rd, who won both the Norfolk and Suffolk cups, looked quite an alien roan among the red troop, in which the Duchesses of Norfolk and Suffolk were foremost. The former of the twain was a short, deep cow, with a good middle rib and a white star on her forehead; while the latter, who succeeded to her honours at Worcester the next year, was larger in frame and rather stronger in the neck. "Norfolk's son" was also there in the shape of Rifleman 2nd by Crisp's Rifleman, a very capital Battersea purchase, and he has added a first at Ipswich, to his Royal Plymouth one. Silence 2nd, another double-first as an in-calf heifer at Worcester and Ipswich was very thick throughout and deep in front; but with rather the Suffolk rib tendency to spring below instead of above. Three teams of chesnuts were busy ploughing up the bean-stubble as we entered the next field—Lady Jane (a prize winner) with Doughty, Dipper with a daughter of Lady Jane, and Doughty's daughter with a Catlin mare—while over the hedge the pick of the Walsingham "crones" and shearlings were busy among the barley stubble, with a Walsingham-Webb ram in attendance. A few steps further, and we are down in the dip hard by the osier bed and the poplars, and crossing the little hand-bridge over the Dove, we reach the outlying farm at Hoxne, in whose stable Brag and her daughter Bonny by Nonpareil were resting after their week's toil. Brag followed up her Warwick two-year-old first with another at Worcester, where Bonny was at her foot. She has won nine prizes in all, and will be seen no more in the ring. Both dam and daughter are capital through the heart, and if the senior has a trifle more length, Bonny is rather handsomer in her quarters. They won as a pair last year at Bury, where Brome had six firsts (and a second to itself in hackneys) for Suffolks, cobs, coachers, roadsters, &c., besides three All England Cups for the pair of best mares, best team of Suffolks, and best roadster stallion (Fireaway) as well. A colt out of Brag, which went there with her, was among the troop of chesnut foals in the orchard behind; but time pressed, and we were barely able to see "Newcastle and Plymouth" Ploughboy, whose dark chesnut coat is shot with grey hairs, take a trot down the road. Then "Hick's horse," or Champion (who has done the stud good service) came round the corner drawing a cart-full of road-clearings, and duly exchanged salutes with his son. We could wish for no sweeter Suffolk scene, and with it still in our eye, and leaving Fireaway perforce "till Bury," we hastened off to leave a card on Surplice.

H. H. D.

TO PREVENT RATS DAMAGING LEATHER BELTING.—It is not an uncommon occurrence in factories where steam power is used, that during the night, or periods that the machinery is stationary and the shop abandoned, the rats will eat the leather belting, where it is accessible to them; for instance, where it passes through openings in the floor; cases have even happened that they gnawed holes in the floor just over a place where a belt was running horizontally, in order to reach and eat pieces of it. Now, it is a singular fact that rats will not touch anything containing castor oil, or even only covered with it, and, therefore, to guard belting against the voracity of these animals, all we have to do is to touch it, at every place where belting is exposed to their attacks, with a brush previously dipped in castor oil. The antipathy of the rats against this useful oil is really strange. Probably instinct teaches them that it is injurious to them; but it is useful for men to know this, in order to guard many substances against their voracious appetite.—*Scientific American.*

EXPERIMENTS WITH DIFFERENT VARIETIES OF WHEAT IN 1864 AND 1865.

By PHIPPS TURNBULL, Little Pinkerton, Dunbar.

PRIZE REPORT.

From the Transactions of the Highland Agricultural Society.

The farm on which these experiments were conducted is situated in the county of East Lothian, parish of Dunbar—height above the sea, of fields where the crops were grown, about 180 feet. The ground was carefully selected, and was of uniform quality and condition, being what may be termed a gravelly loam. The field in which the experiment of 1864 was conducted had been barley in 1862 (after grass); the ground was manured after the barley was removed with good farm-yard dung, at the rate of fifteen tons per acre; in 1863 a crop of potatoes was taken, manured in the drill with 4½ cwts. per acre of a mixture of artificial manures. The potatoes were a good crop.

On 16th November, 1863, the different lots were all sown with a drill machine, the land having been previously ploughed, and manured with finely ground rape dust, at the rate of 5 cwts. per acre. From the schedules annexed, it will be observed that Lot No. 1 of Hunter's was sown one peck per acre thicker than any of the others, the reason being that I found it impossible at first starting to have the machine properly regulated and adjusted to sow the exact quantity intended.

In order to procure pure seed of the different varieties, I applied to Mr. Patrick Shirreff, Haddington, a well-known and experienced judge of grain. He, in the course of a few weeks, sent me Nos. 1, Hunter's; 2, Hopetoun; and 3, Shirreff's bearded white; No. 4 was also perfectly genuine, being purchased by myself from Mr. Hope, Fentonbarns. The ground was exactly measured and marked off before being sown, a vacant space being left between each lot.

March 28-9.—Hand-hoed the different lots, there being a good many annual weeds, and afterwards rolled with a one-horse roller.

April 26*th*.—Examined with Mr. P. Shirreff, and found the Hunter's a little paler in colour than any of the others. Hopetoun looking well; Shirreff's looking fully better than the Hunter's and Hopetoun, principally because it is tillering out beautifully. Fenton is of a much darker green than the other varieties; it is also tillering out well, but looks if anything thin on the ground.

May 7*th*.—Crop inspected by a committee appointed by the Highland Society, consisting of its Secretary, J. H. Maxwell, Esq.; Mr. Harvey, Whittingham Mains; and Mr. Smith, Whittingham.

July 22*nd*.—Measured the straw, and took the average of four different places in each lot (for height see schedule.)

August 1*st*.—There having been a heavy gale of wind blowing for the last 24 hours, I examined the different lots, and found the Hunter's to be more damaged than any of the other kinds. I estimate the extra loss to be about 2 bushels per acre. Hopetoun a little broken down, but not so much as Hunter's; Shirreff's less damaged than any of the others. Fenton broken down, but not to any material extent.

The different lots were all cut with a reaping machine the same height from the ground; they were stacked separately, and covered in the usual way. The season was upon the whole favourable to the growth of wheat, having been dry, with an average degree of sunshine.

The ground on which the experiment of 1865 was conducted was also a gravelly loam of uniform quality and condition, the previous cropping and management having been the same in all respects as for the trial of 1864.

November 14*th*.—Sowed broadcast carefully with the hand the Hunter's and Fenton varieties, and on November 17th sowed the Shirreff's and Hopetoun varieties in the same manner; rain having come suddenly on, prevented the latter from being sown on the same day. The ground was previously ploughed, and manured with a mixture of rape, guano, and bones, at the rate of 2½ cwts. per acre. The seed sown was the produce of the different varieties grown for last year's experiment; the ground was, as on the former occasion, exactly measured and marked off before being sown, a clear space being allowed between each lot.

April 28*th*.—Hunter's looking fresher than any of the others; Hopetoun looking well; Shirreff's and Fenton not looking so vigorous as the other two varieties, but still presenting a healthy and promising appearance.

May 16*th*.—Examined with Mr. Harvey, and we thought the Hunter's looking better than any of the others; all the varieties, however, looking well.

June 6*th*.—Hunter's appears to be of a greener hue than the others; Fenton apparently promising to be second best.

July 5*th*.—Hunter's still evidently taking the lead; the others all very equal indeed.

July 29*th*.—Measured the straw in the same manner as last year.

Aug. 19*th*.—Cut by shearers the half of all the lots.

Aug. 21*st*.—Cut by shearers the other half of all the lots.

I could not say which variety ripened first; they appeared to be all very equal in that respect, notwithstanding the disparity of dates of sowing. This year I consider to have been also favourable to the wheat crop in this district, possessing the advantage over last year of being without any of these high winds, which so frequently damage the crop before it is fully matured.

Tables 1 and 2 show the progress of each lot, with dates of ripening, &c., also the weights of straw and chaff. The former was weighed upon a steelyard, the latter put into bags, and also carefully weighed. Table 3 gives the value per acre in grain, straw, and chaff, of the different kinds. The weights and measures used are all of the imperial standard.

TABLE No. 1.—1864.

Lots.	Varieties.	From whom purchased.	Where grown.	Weight per bush.	Breadth sown.	Seed sown.	When sown.	When brairded.	Came in ear.	When in full bloom.	Average length of Straw.
				lbs.		bush. pks.					feet. in.
1	Hunter's	Mr P. Shirreff	Newtonlees	64	1 Acre	3 0	Nov. 16	Dec. 14	June 24	July 8	3 9
2	Hopetoun	Ditto	Beanston	63	,,	2 3	,,	,,	,, 23	,,	4 1½
3	Shirreff's	Ditto	Hedderwick	63¼	,,	2 3	,,	,,	,, 24	,,	4 1
4	Fenton	Mr. Hope	Fentonbarns	63	,,	2 3	,,	Dec. 16	,, 25	,,	3 8

TABLE No. 2.

Lots.	Varieties.	Ripe and Reaped.	Carried.	Thrashed.	Good Grain.	Weight per bush.	Light Grain.	Weight per bush.	Straw.	Chaff.
					qr. bu. pk.	lbs.	bu. pk.	lbs.	st. lbs.	st.
1	Hunter's	Aug. 19	Sept. 2	Nov. 9	3 6 2	62	5 0	61½	277 0	24
2	Hopetoun......	,, 19	,, 2	,, 10	4 0 1	62¼	4 1	61½	308 0	23
3	Shirreff's	,, 23	,, 3	,, 10	4 5 2	63¾	4 0	62½	351 7	31
4	Fenton	,, 23	,, 3	,, 9	4 7 1	61½	5 0	60¾	323 0	27

TABLE No. 3.

Lots.	Varieties.	Value of Good Grain	Value of Light Grain.	Value of Straw at 4d. per stone.	Value of Chaff at 1½d. per stone.	Total Value per acre.
		per qr. £ s. d.	per qr. £ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Hunter's	36s. 6 17 3	33s. 1 0 7⅓	4 12 4	0 3 0	12 13 2½
2	Hopetoun	36s. 7 5 1⅓	33s. 0 17 6½	5 2 8	0 2 10½	13 8 2½
3	Shirreff's	41s. 9 12 2¼	38s. 0 19 0	5 17 2	0 3 10¼	16 12 2¾
4	Fenton	34s. 8 6 9¾	32s. 1 0 0	5 7 8	0 3 4	14 17 10¼

TABLE No. 1.—1865.

Lots.	Varieties.	Breadth sown.	Seed sown.	Weight per bush.	When sown.	When brairded.	Came in ear.	When in full bloom.	Average length of Straw.
			bush. pks.	lbs.					feet. in.
1	Hunter's	1 acre	2 3	62	Nov. 14	Dec. 10	June 20	July 5	4 0
2	Hopetoun	,,	2 3	62¼	,, 17	,, 14	,, 20	,, 5	4 2
3	Shirreft's	,,	2 3	63¾	,, 17	,, 14	,, 18	,, 4	4 4
4	Fenton	,,	2 3	61½	,, 14	,, 10	,, 20	,, 5	3 10

TABLE No. 2.

Lots.	Varieties.	Ripe and Reaped.	Carried.	Thrashed.	Good Grain.	Weight per bush.	Light Grain.	Weight per bush.	Straw.	Chaff.
					qr. bu.	lbs.	bu. pk.	lbs.	st. lbs.	st. lbs.
1	Hunter's	Aug. 19 & 21	Sept. 1	Sept. 20	5 3	64½	1 3	63	287 7	24 0
2	Hopetoun......	,,	,,	,,	4 5	65	2 1	63	228 7	23 4
3	Shirreff's	,,	,,	,,	4 3	66	1 1	63½	232 1	31 4
4	Fenton	,,	,,	,,	5 0	64¾	1 1	63	259 0	26 0

TABLE No. 3.

Lots.	Varieties.	Value of Good Grain.	Value of Light Grain.	Value of Straw at 4d. per stone.	Value of Chaff at 1½d. per stone.	Total Value per acre.
		per qr. £ s. d.	per qr. £ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Hunter's	44s. 6d. 11 19 2¼	41s. 0 8 11½	4 15 10	0 3 0	17 6 11¾
2	Hopetoun	44s. 0d. 10 3 8	41s. 0 11 6¼	3 16 2	0 2 10½	14 14 0¾
3	Shirreff's	46s. 0d. 10 1 3	43s. 0 5 4½	3 17 4	0 3 10½	14 7 10
4	Fenton	44s. 6d. 11 2 6	41s. 0 6 4¾	4 6 4	0 3 3	15 18 5¾

REMARKS.

In thrashing and dressing the different lots, both years, great care was taken to prevent mixing. Shirreff's I found a little more difficult to thrash clean than any of the other varieties; but I do not consider this to be an objection of much importance, as, where the high speed or English drums are used, it is quite easy to put the drum of the mill a little closer to the concave, when necessary, for different kinds of grain. In estimating the value of the grain I took a fair sample of each variety, stating weight, kind, &c., and had them valued by two first-class corn merchants, according to prices at the time. I estimate the straw and chaff as if, like the wheat, they were to be sold off the ground. It will be observed, on comparing the two years, that there is not any very marked difference in the time of brairding, coming in ear, and being in full bloom, of the four kinds; in crop 1864, however, the Shirreff's and Fenton were four days later of being ripe than the other two, while in crop 1865 they were all remarkably equal in this respect.

Regarding the length of straw, in both experiments, Shirreff's may be said to be the longest, and Fenton the shortest; Hopetoun and Hunter's holding the intermediate places, the former being second longest, and the latter second shortest; the weights, however, of straw show that the shortest (Fenton) weighs more to the bulk than any of the others. In crop 1864, Shirreff's, though measuring 5 inches longer, had only 28 stones more weight than Fenton; and in crop 1865, when measuring 6 inches longer, had 27 stones *less* weight than the Fenton. This is apparently a peculiarity of the Fenton straw, proving that it weighs better relatively to its bulk than any of the others. There is also a circumstance worthy of notice regarding the Hunter's weight of straw, it being lowest of all the varieties in 1864, and highest in 1865. I attribute this difference to the damage done by wind in 1864, as it was "more broken down than any of the others," also its having been sown one peck per acre thicker may have made the straw of that year a little softer and lighter. The produce in grain of Hunter's, it will be remembered, was also estimated to have been lessened by two bushels, owing to the wind. This is rather an objection to the variety in a stormy or windy season.

The weights of chaff are remarkably similar both years in all varieties, Shirreff's (from the beard) being heaviest, and Hopetoun lightest, both years. All the varieties, except Shirreff's, have increased in yield in 1865; in weight of straw, Hunter's excepted, they have all decreased; this must be owing to the season of 1865 having proved more favourable to the formation of grain, and less to that of straw, than 1864. The weights per bushel have also this year been higher, the grain, from the long continued dry weather, being in much better condition than last year. There is another marked peculiarity of crop 1865, in there being much less light grain than crop 1864. Shirreff's, both seasons, has less than any of the others. During season 1865, Hunter's appears all along to have had the lead, looking fresher and greener than the others, and Fenton, as noticed on June 6th, apparently going to be the second best, has turned out as it looked at that time. The exception above referred to in the case of the Shirreff variety, as regards increase of produce in 1865, seems to indicate that this variety is inclined to deteriorate when sown a second year in the same locality; and, for this reason, I think the seed should be changed every year. The table seems to show that the Hopetoun variety is the most unsatisfactory experiment, and therefore not a profitable wheat to cultivate, except on some peculiar soils adapted to its growth. So far as these trials throw any new light on the subject, we may conclude that Hunter's and Fenton still hold their old place as our standard white wheats in average years. It must be admitted, however, that Shirreff's is a valuable variety, and, in some cases, on certain soils, may come well up to, if not surpass, its more established competitors.

CHESHIRE AGRICULTURAL SOCIETY.

CATTLE-PLAGUE COMMITTEE.

This committee met on Wednesday, March 20, at Crewe. Present: Mr. W. Fair, chairman; Mr. Davies, Mr. Goulborne, Mr. Willis, Mr. Slater, Mr. Aston, and Mr. Rigby, its secretary.

The minutes of the last meeting were read, from which it appeared that a letter had been received from Mr. Tollemache, M.P., previous to the last meeting, stating "that it was thought that the Government would not have given any compensation to the owners of cattle slaughtered by orders of inspectors, only it had been discovered that the Privy Council had exceeded its power in giving such order, and the Opposition has assented to the payment to overcome the difficulty;" and as the committee felt the injustice of the case they advocated, in being altogether uncompensated, and thought the principle was so much alike in both cases, differing only in the time of taking possession of their stock, they had determined to take counsel's opinion on the liability of Government to compensate them for the damage and loss it had occasioned by the various orders in Council.

The case had been prepared by Messrs. Broughton and Hensley, of Nantwich, and the present meeting was held to receive counsel's opinion. As the question is one of much interest to all our readers, we give the case and opinion entire:—

Case.

By Act of Parliament (11 and 12 Vic., cap. 107), intituled "An Act to Prevent, until 1st September, 1850, and to the end of the then Session of Parliament, the spreading of contagious or infectious disorders among sheep, cattle, or other animals" (and subsequently continued by other Acts, and lastly by 28 and 29 Vic., cap. 119), it is provided, amongst other things, as follows:—

Sect. 4. "And for the more effectually preventing the spreading of contagious or infectious disease, it is enacted that it shall be lawful for the Lords and others of her Majesty's Privy Council, or any two or more of them, from time to time to make such orders and regulations as to them may seem necessary for the purpose of prohibiting or regulating the removal to or from such parts or places as they may designate in such order or orders, of sheep, cattle, horses, swine, or other animals, or of meat, skins, hides, horns, hoofs, or other parts of any animals, or of hay, straw, fodder, or other articles likely to propagate infection. And also for the purpose of purifying any yard, stable, outhouse, or other place, or any waggons, carts, carriages, or other vehicles, and also for the purpose of directing how any animals dying in a diseased state, or any animals, parts of animals, or other things seized under the provisions of this Act are to be disposed of. And also for the purpose of causing notices to be given of the appearance of any disorder among sheep, cattle, or other animals, and to make any other orders or regulations for the purpose of giving effect to the provisions of this Act, and again to revoke, alter, or vary any such orders or regulations, and all provisions for any of the purposes aforesaid, in any such orders contained, shall have the like force and effect, as if the same had been inserted in this Act, and all persons offending against the same shall for each and every offence forfeit and pay any sum not exceeding £20, or such smaller sum as the said Lords or others of her Majesty's Privy Council may in any case by such order direct."

Sect. 5. "That all orders and regulations made under the authority of this Act shall, within 14 days after the issuing thereof, be twice published in the *London Gazette*, and in case such orders or regulations apply to any particular places or districts, then the same shall be twice published within 14 days as aforesaid, in some newspaper circulating in the county or counties within which each of such places or districts or any part or parts thereof respectively is or are situated."

It will be remembered that the cattle-plague, which has since committed such fearful ravages, especially in Cheshire, broke out in the summer of 1865, and the Privy Council from time to time issued orders in exercise of the powers given to them by the above-mentioned Act.

The following are the dates of the orders of which copies are sent for reference:

The 24th July, 11th August, 18th August, 26th August, 22nd September, 23rd November, 16th December, 1865.

For the purpose of this case, it may be sufficient to direct attention to the Orders of 22nd September and 23rd November, which were in operation in Cheshire while the disease was raging there.

By clause 17 of the September Order it is provided that "all animals having died of the said disorder, or having been slaughtered on account thereof, shall be buried with their skins and with a sufficient quantity of quicklime or other disinfectant as soon as practicable, and shall be covered with at least five feet of earth, or shall, in districts for which an inspector has been appointed, with the consent of the owner, be otherwise disposed of in manner directed by the inspector."

The November Order revoked the power given to inspectors by former orders to slaughter cattle, but imposed restrictions on the removal of cattle, which virtually amounted to a suspension of all traffic.

This state of things continued until the passing of the Cattle Disease Prevention Act, 1866 (20th February, 1866), which introduced a new principle, namely, compulsory slaughter, and compensation out of a local rate, and in Cheshire a Government loan of £300,000 has been obtained to pay the compensation and expenses under the Act, which loan is to be repaid out of the rates.

A feeling of great dissatisfaction exists in the county, on the part of those farmers who lost their cattle previous to the passing of the Act, and who consider that by the action of the Privy Council in appointing inspectors, dictating mode of burial, and restricting removal for sale or otherwise, possession was virtually taken of their stock in the public interest, and that if they are not entitled to the whole value they should at least receive compensation for the loss of the hides, &c., and also those who had sold their cattle, but were unable to deliver them on account of the restrictions, should be paid for their loss.

Farmers having 50 or 100 cows, for which they were offered £10 a piece by butchers in the large towns in the neighbourhood, suddenly found themselves unable to carry out their bargains in consequence of the Orders of the Privy Council, and, instead of receiving £500 or £1,000, had to retain their stocks until the disease reached their farms and carried off the cattle.

A particular instance of this occurred in the Nantwich Petty Sessional Division, where a farmer had sold a large number of fat beasts to a Wolverhampton butcher, but being at the time prevented by the Orders from removing them, he had the mortification of seeing them attacked by the disease in the following week, and thus incurred a loss of from £700 to £1,000.

It may be mentioned that in the present Session Parliament has passed an Act for giving compensation to those parties whose cattle were slaughtered by order of inspectors between August and November, 1865, as it was considered that the Act 11 and 12 Vic., c. 107, did not authorise slaughter.

Counsel is requested to advise—

1. Whether, in his opinion, a claim could be successfully prosecuted against the Crown, or any other person, for compensation to those who lost their stock prior to the Act of 1866, in consequence of their being unable to remove them when sold.
2. Or for compensation for loss of the hides, horns, and hoofs, in consequence of the enforced burial of the cattle with their skins.

And generally whether the parties have any remedy whatever for the damage sustained by them through the restrictions imposed on their dealing with their property by the Orders of the Privy Council.

I am of opinion that no claim can be successfully presented against the Crown, or any other person, for compensation in the cases referred to in the questions. The 32nd section of the 29 and 30 Vic., c. 2, directly confirms all the Orders in Council which had been previously issued, and it is therefore impossible to allege that any of the Orders were illegal. The act at the same time gives no compensation to persons injured by the effects of the Orders, and therefore no such compensation can be claimed. GEORGE MELLISH.

3, Harcourt Buildings, 20th March, 1867.

The SECRETARY then read the annexed letter from Messrs. Broughton and Hensley, which he said he was sure would be gratifying to the Committee, as it was generous in the writers:

Nantwich, 23rd March, 1867.

DEAR SIR,—We send you the case and opinion of Mr. Mellish, which, as we feared, is adverse to the claims of the farmers.

We also enclose our charges, but we wish all except the amount we have actually paid, viz., £6 10s., to be given to the funds of your committee, as we have no wish for any personal remuneration for our trouble.

We are, dear sir, yours faithfully,
T. Rigby, Esq. BROUGHTON AND HENSLEY.

A cordial vote of thanks was then passed to Messrs. Broughton and Hensley, and the secretary instructed to forward the same.

The next business of the meeting was to consider if anything more could be done by the committee in any other way to further the object they had in view. The Secretary said it was matter of regret to them all that their efforts had been fruitless, and they could not hope to do anything more in the same direction, but it occurred to him that they might send a memorial to the magistrates of the county in quarter sessions, as the cattle-plague authority, praying them to remit the cattle rate to all those whose cattle died before the Act of 1866 was passed, to the extent of what they would have received had they been compensated to the amount of £2 per head for hides and burials of all cattle that so died. Of course this would amount to but a small amount to many who had been great losers compared with their loss, but it would be better than having to pay ever so small a sum for a course of years towards the losses of others, and he thought that the boroughs and towns would sympathise with them so far as not to oppose such an arrangement. The magistrates, as the cattle-plague authority, had a discretionary power of this kind given them by the Act, and he thought they might safely assume they would exercise it in this way if memorialised to do so. He would therefore suggest that they do this before dissolving their connexion as a committee, and hold themselves organised to urge the matter again when the time came round for the rate to be levied, if they were spared to see it.

The Committee unanimously assented to this view, and Mr. Fair, Mr. Slater, and Mr. Rigby were appointed a deputation to wait upon the Chairman of the Quarter Sessions with a statement and memorial to this effect.

The Committee then adjourned until the 2nd May next, the day appointed for the adjourned general meeting of the Cheshire Agricultural Society, when a balance-sheet of receipts and expenditure would be submitted to the meeting.—*Chester Chronicle.*

AGRICULTURAL MACHINERY.

The farmers of our eastern States, compelled to till rocky and uneven lands, and used to small holdings, do not know by experience, all of the changes which *improved machinery* has wrought in agricultural operations in the great western prairies. There machines do the labour of men to such a degree, that the farmer's heaviest toils are lightened, and one man is enabled to achieve with ease, the work of half a dozen.

We saw recently, a corn-field of one hundred and sixty acres, on the "Grand Prairie," in the ploughing, planting, and cultivation of which, no man walked a step. A rotary spader drawn by four horses, and driven by a man upon the box, ploughed the field to a uniform depth of eight inches, and gave such thorough tilth that it was not necessary to use a barrow at all. A corn-planter drawn by two hores, and driven by a man upon the box, next planted the seed. A cultivator drawn by two mules, one walking upon each side of the knee-high corn, and driven by a man upon the box, completed the culture of a row at a single operation; and in the tool-house lay another machine, also to be drawn by horses, which will cut down the corn when it is ripe. and lay it in regular rows, to be finally gathered by hand. But it is expected that by next year this machine will be so improved as to gather up the corn also.

When it is remembered that the farmer who follows the common plough or cultivator during a long summer's day, performs a march of from ten to fourteen miles, it will be seen what a boon is the machinery which relieves him from this toil. And when we remember how scarce were men during the last four years in the West, we shall see that but for such labour-saving implements our vast crops of cereals could have been neither planted nor gathered.

The farm of which the corn-fields we speak of was a part, has seven hundred acres in a single field of timothy. Of what use would this be if it had to be cut by hand? But a half-dozen harvesting machines sufficed to cut it all in good time; and it will do without "groaning," the work of half a regiment of men; patent horse-rakes gather it up, and two hay-presses upon the place, squeeze it into bales fit for shipping. Seventeen and a half miles of board fence enclose a little more than half of this farm, which has as part of its furniture, comfortable sheds for 10,000 sheep, a rat-proof corn-crib holding 15,000 bushels of corn, and extensive stabling for horses.

What machinery has thus done for the West it will do for the South, now that free labour is substituted for that of slaves. We see no reason why the cotton and sugar fields of a great part of the South should not be tilled by machinery. These fields are—in Louisiana, Mississippi, and indeed in almost the whole of the cotton and sugar region—level and devoid of rocks; and these are the only conditions necessary to the successful use of the most valuable farm machinery. The slaves, ignorant and careless because they have no interest in the work, used only the rudest and clumsiest tools; but in the hands of intelligent freemen, the rotary spader or steam plough, or cultivator, can be used as well on the immense level bottom-lands of Louisiana, where sugar is grown, as on the prairies for corn and wheat.

Yankee ingenuity, too, will presently set itself to work to devise new implements for the more economical and rapid prosecution of such labour as cotton-picking and cane-cutting. The next ten years will witness an immense revolution in the methods of cultivating the great staples of the South, and the fruits of that change will be a greatly increased production of cotton and sugar by the help of free labour, and—what the use of machinery always brings with it—such increased rewards for intelligent labour as will prove, even to the most ignorant of the southern population, the importance of schools and the pecuniary value of education.—*New York Evening Post.*

THE NEW FARM.

Well, I have about made up my mind respecting the moles. My bailiff informs me that an excellent hunter has offered to keep our invasion down for a halfpenny an acre, if I will supply him with new traps. This looked so much like a trap for myself, that I have informed mine excellent helpmate, who is not a 'coon of the first water, that we will let the host alone, and study consequences with a view to future action. One fresh line of hillocks I noticed yesterday, thrown up across a wheat field put in after clover ley. They cross the brow, however, where I have noticed the plants look feeble for some time past, so that I have hopes they mean me real service, especially as the rooks begin to settle on the same tract too.

Our birds, bar blackbirds, which after repeated expostulation I have allowed the gardener to wage war on, not altogether so reluctantly either, as they have to my mind a sneaking element in their disposition; always haunting the low branches of the bushes, mistrusting one's approach more than any other of the feathered tribes, and not only that, but screaming an alarm to the whole neighbourhood as they start off through the brushwood—our birds, I say, selves and nests, we religiously spare, only trusting that we may not be ultimately disappointed of the benefit they are said to work by the extermination of the insect hordes. Our cocks and hens about the homestead are a nuisance upon all fields, but the pasture. They have such an aptitude not only to scratch and roll where they needn't, but to nip off the green seedlings, turnip, cabbage, &c., as soon as they appear above the surface. I cannot comprehend how Mr. Mechi finds them do him such striking service as he says they do.

The mention of seedlings brings to my mind a curious circumstance related to me lately by a clergyman who is successful in gardening. Last autumn he cut down the stalks of a bed of Jerusalem artichokes, and threw them at random upon the rubbish heap. The other day, having occasion to excavate the lower strata of that deposit for stuff wherewith to condiment a flower-bed, on removing the undecayed artichoke stems, he found to his astonishment a tiny bulb attached to every joint of the stem. One knows that once planted this root is difficult to exterminate, but it was a wrinkle to find that the plant has such extraordinary reproductive power, which one might be thankful to find belonging to some other orders of vegetable.

"Never heared on sich a thing afore," was the simple commentary of our pumpkin-shaped gardener; an occasion which I took care to improve by remarking, "I'll tell you what it is, old fellow—this ought to be a caution to you when you get an extra suck of cider at the hay harvest and get snoosing under a cock: I shouldn't wonder if you were to get up, some day, with a new-born brat hanging from every joint, knee, and elbow—an accession of fortune that neither you nor the parish might be thankful for; so just accept the moral, and don't slumber during working hours, harvest time, or otherwise; for I expect that bass-matting in the tool-house may have an especial tendency to promote such an undesirable growth if reclined on of a wet day, the more so too if a pipe give additional forcing heat to your system."

It was an opportunity of reminding him that (whether he indulges so or no) his master is up to a trick or two—a conviction which we trust may spread its beneficial influence throughout one's dependent people.

This same old ally informs me that Jerusalem artichokes "bean't of no manner of use for pigs; him have tried 'em ever so many times, raw and biled, but the monkeys moots 'em out." I listen, as of duty bound, to mine faithful help, but notwithstanding resolve inwardly that I shall adhere to my purpose of planting a rough arable hill-side (too sandy to make a pasture) with this same esculent, which requires so little cultivation, and I will see whether we cannot induce in our porcine possessions the same delighted appreciation that one has of them oneself upon the dinner-table, and be content that in the interval he should deem me, as he doubtless will for my pains, a Jerusalem pony.

Our hill-side tract it is not all fun to cultivate. Some parts, all rough with boulders of a kind of pudding-stone—a conglomerate, hard as iron, of semi-opaque pebbles, out of which are wrought the cider-millstones of the country, we resign to the gorse and fern, being thankful for the game they shelter during shooting season. Delightful is it to sit there of a summer evening, cheroot alight, upon one of these blocks—which once formed the bed of the ocean, and are now upheaved to be the highest ridge of the district, commanding a full view of the whole farm—and watch the tints, various as hues of the dying dolphin, reflected upon the level reaches of our lovely Wye.

Other upland patches afford nice picking for the flock, but not such as one meets with on the wild Welsh hills. It is in the very centre of one of these that there bursts out the eye of a spring, (as the Greek and Welsh so beautifully term it) "clear as crystal and cold as charity." Close beside it is the twisted stem of an antique wild crab-tree, under which we propose to erect shortly a grotto, and just beyond a hazel copse, on which we gathered last season some bushels of the sweetest nuts.

The spring itself we shall utilize as follows: First and foremost it will deliver its sparkling jet, fresh filtered from the internal cavern of its birth, into a circular basin of rough-hewn forest stone, from which the drinking supply of the house will be fetched. [As regards this, I must record one friend's remark, "Faith, it's a beautiful liquor; a bottle of it sealed would last one a lifetime."] The basin's overflow will feed a shallow reservoir, cemented and gravel-strewn, with an occasional deep hollow upon which will be piled a few irregular pieces of rock, so as to afford shelter to the fish, of which a regular supply will be kept for the use of the house, being constantly replenished by netting the river-pool below. This reservoir there will adjoin a flat bed of the crisp brown-leaved watercress, escaping from which the exhausted current will be allowed to soak indolently into the turf of a winding gully, to be planted with willows as a pleasure-ground for the pheasants.

The period of enjoyment in this summer-house seems, however, just now a long way off, while we contemplate the deep snow-carpet so suddenly spread, and listen to the wind so discontentedly howling at every crevice. Comfort now for the stock is only in the sheds and boxes, which, all fresh laid with sweet straw and fern, quite realises one's idea of brute creature enjoyment. To leave the poor things cramped up and shivering upon the fields were one might fancy the height of cruelty. The wild breeds on their unrestricted feeding-grounds find plenty of warm nooks under rock and tree wherein to spend the dull tedium of such a season; whereas thoughtless man exposes to the pitiless blast, between open hurdles, or on a wind-swept, hedgeless meadow, the flock and herd that he has comparatively enervated and rendered tender by cultivation. To a certain degree they may undoubtedly be habituated to exposure, but it is anyhow waste, seeing how warmth conduces to fattening.

Habit—what a thing it is! There is nothing like being used to it, as my charming sister-in-law remarked the other day, on coming down to welcome our party, with a face beaming more than even usually bright from the exertion, as she explained, of tearing up strips of calico by her baby's ear, because it started at the sound of an accidental rip. By dint of this same habit, I was once enabled to discover the delinquency of a groom, who, first-rate hand when he chose, unhappily did not often choose, and, who having fallen into the service of an epicurean, soon began to give sundry symptoms of neglecting his work. After he left me, I found that at a previous place (how is it that, like Parisina's maidens, so few will help you in time of need with a hint? whereas, after the catastrophe, they one and all overflow abundantly with, "Ah! that's just what I expected!" "I knew that would be the case!" &c., &c.) —however, to return, I found that this fine fellow, being in the service of a Cheltenham dowager, used to clean only the side of the carriage that was next to the door as he drew up. To return further: suspecting him of being addicted to lift his little finger, one summer evening I rode slowly along highway and byeway by every neighbouring public, soon detecting his various haunts by the deliberate stand my thoroughbred made against the passage to the cider-tap. When I had consolidated the charge sufficiently to bring it home, he was, I heard subsequently, much puzzled to know how I could have gained my information so accurately, and would doubtless, had he had the chance, have wreaked his vengeance on the dumb detective.

As I was watching some peas being put in, the other day, a smarting hailstorm and heavy wet came on, which sent me quickly under a tree and my umbrella, despite the supposed hardening with which one's matutinal cold-bath is credited. Meanwhile, there stood, calmly watching the operation, a young broad-built son of our village Vulcan, who has not seen his sixth birthday yet, notwithstanding the chill rain-pour, without a symptom of uneasiness. I almost think the rain never pierced his raiment, scant as it was. The soul of fire he inherits may possibly have helped his endurance, multiplying or neutralising—which you please—the usual effect of a driving sleet-shower. Blessed habit again, methought!

How deep again lies the vein of early attachment to agricultural affairs. This last week only I have spent long happy fleeting hours in the company of one who is now a distinguished dignitary of the Church of England, and an earnest promoter of all that is good and charitable. He can number seventy winters in the snow upon his head; yet there are few young members of his profession who could outstrip him in energetic beneficial service to his fellow-creatures. Now, in the intervals of work, there is nothing he prefers by way of relaxation to a talk about shorthorns—a small, but goodly, herd of which he reared at the period when Mr. Berry and Mr. Bates were at their zenith, his anecdotes of conversation with whom are entertaining as instructive; as are also his comments upon the forefathers of our stock—Belvedere, Pilot, &c., a small volume of which I deemed it worth while to note down at his lips. How delighted he was too to scan and discuss the points of the type of cow that I have selected as my model.

I had with me a portfolio of clever and singularly truthful sketches in oil, done by my friend, Mr. E. Corbet, which I always carry about with me by way of consolation when from home. It is a plan I commend to my shorthorn brethren, for the twofold reason that they will like to look back in years to come upon the materials of which they so carefully compounded their herd, while again it will be a public benefit to have attainable for study the lineaments of many a famous ancestress otherwise known only through the written record of her pedigree. We would most of us subscribe heartily, I doubt not, could we obtain a pictorial idea of the early celebrities—Sockburn Sall, &c.—so very few of whom are to be found in the *Farmers' Magazine* or *Herd Book*.

Right glad am I to hear that Mr. Carr is going to give us an enlarged reprint of his essays on the Booth sort. Would that some competent person would compile a clear reliable account of the other great breeder's experiments and experience.

Did I not, in my last, register my determination that I would breed no more horses? Yet, what shall I do herein? I have just had returned by a friend, who has hunted her the past winter, one of the grandest timber-jumpers in England (her grandam by Touchstone too), lame—quite lame. I am tempted to cross her with the Stockwell blood, and make her pay her way by work upon the farm, Foolish I feel I am; but what can one do with a pet of wide celebrity for her performances in the hunting field? And am I not convinced, moreover, after repeated trial, that, too generally, half-bred horses are useless upon a farm, unless they be considerably advanced in years, and you can put them under the care of a regular, good, steady, intelligent fellow, who will never leave them standing by themselves in the plough or cart? The risk attending their use greatly exceeds any advantage their speed may give. To suit the ordinary labourer, you must have the regular plough-horse as fast walking as you can obtain, but there must be no galloping or impulse to start off in him. The fellows who can manage spirited horses at agricultural operations are usually of a sort that should not be on a farm at all, if they had given their skill, head, and ability a fair chance. Should you find them after a team, sadly be it stated, there is too often reason to suspect a penchant for public-house entertainment, a course of which some day or other mischief will inevitably come. One good smash of cart and frightened horse takes the gilding off a long slice of farm work. A big or broken-knee, a disabled vehicle, and shivered gate (if not worse), nay, even the anticipation of such misadventure, yields too many a pang of discomfort for the wise to adopt the use of such a team. But then, no one is wise at all hours, the Latin grammar teaches; and in regard to this grand mare, one feels an unwise wavering of purpose.

"What do you advise?" asked a young officer the other day (an old friend and pupil): "I am thinking of getting married." "*Don't* by any means; think of the horrors of a wedded life in a marching regiment, seeing that you are not a man of fortune." "Oh! but she's such a nice young girl," he replied, with evident disappointment at my counsel. "Very well, then; do." And I sent him away delighted; and to say truth, I don't think he did so badly after all. But we are off the rails. Is it do or don't, as regards this favourite huntress? Time alone can show.

Alack-a-day! the morning hath returned, and with it a new unrelenting fall of snow. There is nothing for it but steadily to forge our way onward in its teeth, foddering and littering without stint. But we are in for a misfortune I fear. The bailiff just informs me that our pet of all the pet herd, a short-legged, square-built, but most elegant cow, bred by Sir Charles Knightley, and possessing in a high degree the characteristics he aimed at—the breadth of back, the shoulder sloping as that of a race-horse, the small refined head, broad-browed, with short, flat, waxy horn—shows symptoms of being burdened with a dead calf; that calf which, if a bull, we had intended to be the father of a future generation. Every care has been taken of her during gestation. She is within a fortnight of her regular time, and has milk in her udder; but the signs that present themselves are unfavourable. We can only hope.

Bad cess to the period! Again there is sorrow and consternation through the household. A favourite half-Angora cat (a property of the nursery) is brought in with both fore-legs smashed in a vermin trap, a fate we have ourselves been long anticipating, inasmuch as my lady had begun to be neglectful of her household duties, and to go a-gipsying. There was nothing for it but to put an end to her misery. Her habit of lapping up the milk with which the children supplied her was peculiar. Instead of applying her tongue directly to the surface, she dipped her paws in the dish, and then sucked the same with very much the air wherewith Augustus smoothes and twists his moustache.

Of our crops we can say nothing, as they are simply out of sight. But here comes an old friend, one of Wellington's aides-de-camp at Waterloo, trudging over the snow, to have a game of billiards, with slippers in his pocket, but nothing on his feet but two pair of woollen socks, which keep them dry and warm, a dodge he learnt in Canada.

VIGIL.

MILLS AND MILLING.

3.—ARTIFICIAL STONES AND GRINDING SURFACES.

Under this, the third division of our subject, we propose noticing some of the various materials of which millstones, steel plates, and other grinding surfaces, are made. The term "artificial millstones" is more commonly used in a limited sense, embracing only millstones or grinding surfaces of some sort of mineral or metallic composition; but French burr-stones are often so porous that they require to be filled up with alum, grit, or other mineral substances, while the pieces are invariably put together with plaster of Paris or some other similar cement, so that their manufacture involves the principle of making an artificial compound in this limited sense, although by it French burrs are excluded. We therefore propose using the term "artificial millstone" in a more extended sense than is generally implied in the above limited signification.

The materials of which the grinding parts of mills are made may thus be divided into four kinds—(1) stones obtained from quarries, that require manufacture; (2) pottery-ware; (3) steel and metallic compounds; and (4) combinations of two or more of these three.

(1.) Of the first of these (stones obtained from quarries, that require manufacture) the world presents a very great diversity, almost every country yielding millstones of some kind or other, less or more diversified in their geological and mineralogical characters. During the French wars, when the supply of burrs was to some extent interrupted, attention was naturally turned by millstone-manufacturers in England to our home supply. Encouraging premiums were offered by the Society of Arts for the discovery of stone adapted for grinding wheat; and good millstones were found near Conway, in Wales; the Peak, Derbyshire; and from the basaltic rock of the Abbey Craig, Stirlingshire. From time immemorial, our millstone-grit rocks have yielded millstones for grinding both oatmeal and wheaten flour; indeed, the designation "millstone-grit" appears to have had its origin in this very fact of its being adapted for and used in grinding. In the olden time, the bringing home of the millstones from the quarry was an undertaking of no ordinary magnitude and importance to the miller. At that time, the railway locomotive was not thought of: carts and waggons were the exceptions, and pack-horses the rule, so that the miller had to wheel his millstone all the way from the quarry to his mill on its own edge, up hill and down dale; and to this day there is many a hilly district in which the names of bogs, gullies, and quagmires remind the modern tourist of the miller's misfortune in times long gone by, when the millstone, acquiring a momentum greater than the strength of the hauling-ropes could restrain, went leeward out of its course, and so was lost in the quagmire below, never to be seen again, although occasionally now and then heard when grinding, at midnight, the corn of the mystical genii, who use to inhabit all such unlucky places. The tradition of many, if not every, district may be left to supply the details of the miller's undertaking in fetching home his millstones from the quarry. On the continent of Europe there has also been a great variety of millstones used, although at the present day the general supply may be chiefly obtained from a few quarries only, as French burrs from the Paris basin, and a species of porous lava-stone from the Rhine, which is said to have been used for upwards of two thousand years. The millstones in use in Egypt and the East at the present day are doubtless taken from the same quarries as those of ancient times, and present likewise much diversity, although preference is given to certain qualities; and the same may be said of the new world, America.

Millstones from quarries are either wholly of one piece, such as the old ones of millstone grit, or they are made up of parts, as burrs, basaltes, and lavas. With both these plans our readers are familiar, and therefore it would be superfluous to go into minute details. But although the common practice of manufacturing burr and other built millstones is almost universal, yet there have been proposed and carried out into practice many exceptions to the common rule thus generally followed. These exceptions have been manufactured for various purposes, such as to increase the durability and effect of the grinding surfaces, to obviate heating, to grind more lively, and to produce a finer sample of flour. These are conditions which we do not propose discussing under this head. All we have to say at present is, that millers have from time immemorial been familiar with them, and so have millstone manufacturers; and therefore it would be unreasonable to suppose that nothing had ever been done by them in deviating from the common rule to effect the above purposes. No doubt when millstones were first built, as French burrs now generally are, the maxim of the manufacturer was to imitate the old stone hewn out of a single block of rock. At that time, it must be borne in mind, stone-hewing had attained to a very high degree of perfection in all its branches—higher, some say, than at the present day. Those, therefore, who speak disrespectfully of the ancient art of millstone manufacture, in order to enhance the importance of their own doings, are not warranted in their conclusions. And we aver that the ancient Germans and Romans had attained to a higher degree of art in millstone manufacture before the Christian era than is generally credited in these piping times of modern progress. Indeed, very great caution is necessary in laying claim to discovery in a branch of art so old and universally practised as the one in question. No doubt at that time the inhabitants of this country were composed of a discordant brood of semi-barbarians, parching their corn in the ear and straw, braying it in mortars, and grinding it in querns many degrees more rude than Pliny describes the practice of the Etrurians, Carthagenians, and Romans in his time. And no doubt also, when our millstone manufacturers began first to import the burrs as they came from the quarry, and to imitate the French and German workmen in supplying our millers with home-made manufactures, there may have been a few air-holes right through the stones before they had performed the incalculable revolutions of a twelvemonth's continuous grinding. Some old miller will perhaps reply, "I have seen this in these boasting times of crack handicraft;" adding as a clincher, that "the holes were an improvement so long as the 'sectors' kept their position, as they increased the effective grinding power of the stones, by keeping the grain being ground at a lower temperature, the grinding surfaces going lively, the aroma of the flour from being destroyed, thereby producing a better quality of flour." Hence the modern discoveries of "holes," "horns," and "openings" both in the runner and bedstone, purposely made in the manufacture, in order to let out heated air, and let in cool, and so forth. But is it not hard to make the old miller, when his badly or loosely put together stones, which have been doing their work so well for a long time past, go to the dogs, pay royalty and licence for new ones made exactly on the same principle, but not quite so successfully carried out? or rather is not the old miller an arrant prodigal who thus pays licence and royalty for his own discovery? True, these modern holes, horns, and openings involve special mechanism, and the principle on which such mechanism is constructed being public property, this is all that can fairly be claimed.

Again, when manorial grist-mills were abandoned, and when opposition millers became fired with the zeal of beating their old grist rivals out of the market, there was an endless variety of experiments made in the history of burr and other millstones, so as to effect the above purposes. These experiments will be found reported in scientific works and literary publications of that period. They were also commented on and illustrated in most class-rooms where experimental philosophy was taught. At the commencement of the present century the several doctrines of "progressive grinding," "continuous grinding," and "alternate grinding," were minutely discussed in all their varied practical bearings upon the quantity and quality of the flour, and the amount of work performed in a given time by a given motive power. We shall find under the head "Progressive Grinding" that so early as the year 1546 the grinding of corn twice was publicly forbidden in France as being injurious to the health of the inhabitants. At present the question we have to propose for solution is briefly this: What does all this bygone experimental philosophy imply, relative to the manufacture of millstones? That the diameter of the stones and the number of revolutions per minute, as found in tables in every book on millwork, were all that had to be determined? Certainly not; for innumerable experiments were made in the manufacture of millstones, so as to secure the above conditions, although the majority of them were not considered to involve practical merit sufficient to command their general adoption, the preference being given to the common method of manufacture then and still in use—a method which involves the doctrine of "continuous grinding" throughout the process of milling, in contradistinction from "progressive grinding," when the grain is first ground into meal between one pair of stones, and then into flour between a second pair; and from "alternate grinding," where there are radial openings from the eye to the circumference of the runner, or bedstones, when the runner is below it, for the purpose of letting out the heated air, for fanning and centrifugal action, as will subsequently be shown under its proper head. And lastly, experiments have been made with all the different forms of grinding surfaces already discussed, and also positions of the millstones.

The mechanical shortcomings of millstones made of burrs and lavas are their unequal porosity and toughness, so that they grind and wear unequally. To obviate this as much as possible, our manufacturers either visit the quarries themselves, so as to make the best selection in their power, or else employ men of equal skill and integrity. The basalts are of a more uniform texture, and in a few reported cases have even superseded and been preferred to burrs; but in several respects they are obviously inferior for grinding flour. The quartzose, porphyritic, and granitic millstone grit, and some other examples, have each, too, had their advocates, and still have them in places where they are easily had, and nothing else lies within easy reach, and where the prime cost settles every consideration.

2. *Pottery-ware and Artificial Compositions.*—The ancients were familiar with various processes of making artificial stone —brick and pottery-ware—which have not come down to our day. The old Roman roads in Italy bear out this conclusion, were we not in possession of other evidence. We have only further to refer our readers to the numerous relics of this kind in the Assyrian, Egyptian, Greek, Etruscan, and Roman galleries of the British Museum, where visitors are eye-witnesses of the high attainment of former times in this branch of art; and of such materials mortars, pestles, and millstones were made.

At a very early date artificial millstones of this sort were proposed in this country, and numbers of them have been patented. One of these, No. 3,727, A.D. 1813, by a citizen of Dublin, we quote for an example, as it is short, and involves another principle, viz., *perforating potteryware for the purpose of more readily baking or burning*, besides the manufacture of millstones. The specification of the patentee runs thus, under the following three heads, viz.:—"*First:* I mould or form into convenient-sized or shaped pieces any of the well-known earthen compositions or bodies which become partially or completely vitrified by exposure to a strong heat; and I do make, in any convenient manner, such a number of small channels, holes, or cells in or through the said pieces as may facilitate the baking or burning of the same, and give each of the said pieces one or more porous or cellular surface or surfaces.

"*Secondly:* When the said pieces are nearly dry or hard, I coat or cover the same with any of the well-known glazing slips used by potters, for the glazing of earthenware; and I do bake or burn the said pieces as stone-ware or earthenware is usually baked or burned.

"*Lastly:* I connect or unite by plaster of Paris, or any other convenient cement, several of the said pieces together, as French burr millstones are usually connected, for the purpose of grinding corn, pulse, or other seeds, into flour or meal."

3. Of steel mills there has been an endless variety in use, and the comparative success which attended the military mills of Napoleon I., already referred to, gave an impetus to their construction in this country. Mortimer, in his work on Agriculture already quoted, gives a drawing and description of a malt mill, in which he proposes giving the cylinders a grinding-action, by making the one cylinder rotate at a greater velocity than the other, and on this principle it has been proposed to grind or manufacture flour. The principle is that of the Arab's spindle pestle and mortar, which, they told Niebuhr, made better flour than the hand or water-mill. A much greater diversity has been given to the form and position of the grinding-surfaces of metallic mills than to the common sort of millstones. The grinding surfaces have been furrowed for clipping, roughened or struck like a file or rasp for grinding, filing, and rasping; while an endless variety of combinations of these processes has long been public property in principle.

4. Recently patents have been granted for a combination of metallic and earthy substances, of which to manufacture millstones. There is, however, nothing new in the principle of the proposition, for it has been known and practised by potters from time immemorial, and therefore is included in the old patent of 1813—3,727 above-quoted. We do not say so to throw cold water in the face of this return to the solution of an old problem, but the contrary; for we aver that the best burr millstones, lavas, and basalts may be superseded by the productions of art, were modern Chemistry to exert her talents in this direction, because the inorganic chemistry of nature is much more easily imitated and copied than the organic chemistry exemplified in the animal and vegetable kingdom. In point of fact, very great advances have recently been made in this branch of applied chemistry. Various mechanical combinations of steel, stone, and pottery-ware have also been proposed, the alternate layers being either built in zones or in radial lines, furrows and lands, &c.

4.—RUNNER DRESSED, AND GRINDING ON BOTH SURFACES BETWEEN TWO BEDSTONES.

General claims of this kind, variously specified, have recently been made in several patents. The mechanical principle of construction has long been public property, and therefore all that can now be fairly claimed by inventors and patentees is improvement in special mechanism. Thus, steel mills, with runners, grinding on two conical or spherical surfaces, with corresponding bedplates, are common; and a few exceptionary examples of burrs, lavas, and artificial stone have been made. Almost all the old patents, and non-patented examples also, that appeared as improvements of the French military mills of Napoleon I., specify steel, stone, and all substances of which millstones are made. The steel mills are for the most part conical ones; but the two frustrums of which the runner it made, are sometimes joined base to base, and sometimes the opposite, and parallel sections. In both these examples the bedplates of course correspond with the form of the runner; and this also is true of burrs, peaks, lavas, and artificial millstones.

Decorticating and hulling-mills furnish another familiar example of the runner being a dressed cone, or cylinder, working on both surfaces, the latter likewise on the periphery against an opposing surface. True, the function of the runner in mills of this class is not exactly that of the manufacture of grain into meal or flour; but in conceding this, it must also at the same time be granted, that in the manufacture of very fine pearl-barley, groats, and some other articles, a very large proportion of the grain and seeds is made into flour; and farther, that flour from the outside of grain has actually been purposely made by this decorticating process, so that the principle of construction cannot be denied. The mills dug from the ruins of Pompeii may be quoted as examples of the olden time. Moreover, it is necessary to bear this latter fact closely in mind; for, as there is a chemical difference between flour from the exterior portion of the grain and flour from the interior of the kernel, this plan of grinding may consequently come into more general use for medicinal and other purposes, thereby giving rise to special improvements in the construction of such machinery. But of this, more after in subsequent papers. In point of fact, this is just what is now taking place in the march of discovery, which is one reason why we give the claim a special notice, which otherwise it would barely deserve.

5.—COOLING BEDSTONE BY CURRENT OF WATER.

The bedstone at times, by continuous rapid grinding, acquires a very high degree of temperature. What the highest degree ever attained may be we are not in a position to inform our readers; but we have heard an old miller (who was rather fond of the marvellous) say, that he has had his bedstone as hot as a *breadstone*," which obviously implied that it (the millstone) would have baked the flour or meal which it had ground. Others have, with perhaps less exaggeration, declared that their stones at the close of the milling would have "hissed in cold water." But neither of these anticipates the principle of our proposition, and therefore it may be allowed to pass muster as one of our modern novelties. It contains, we may safely add, more merit, practically speaking, than may at first sight perhaps be perceived by the inexperienced; for when the bedstone becomes heated, it produces steam, and rarifies the air between the stones, thereby counteracting the movements of both air and flour towards the circumference of the millstones. We shall return to this view oft he subject at more length, under the claim of *aërating the stones*. At present it shall only farther be added, that the idea of a current of cold water to keep the bedstone cool, by carrying off caloric, is pregnant with many important suggestions on what has long been experienced a cardinal point in milling, one which has not yet received a satisfactory practical solution, *i.e.* cool grinding and cool flour.

6 & 7.—COVERING EYE OF RUNNER AND BEDSTONE.

The above two heads, or claims, may be more profitably discussed together than separately, as they require to be closely scrutinised, in consequence of their stating one thing, and claiming another. In the mills of the ancients the nether millstone had no eye, the pivot upon which the runner turned as a fulcrum being rigidly fixed in the stone, the motive power in actuating the runner being applied to a handle fixed in the upper surface at a distance from the eye, so as to obtain a crank leverage.

To rotate the runner by means of a spindle passing up through the eye of the bedstone was doubtless considered, at one time, an important discovery in the march of improvement in the construction of mills. The chief peculiarities in the invention are as follows: (1) an eye to the bedstone; (2) a spindle; and (3) a "rynd," "cross," "fork," or "dovetail," for rotating the runner. Accustomed to such special mechanisms, with the principles upon which they were constructed, and the function they individually and conjunctly serve, as the common mechanical property of the public, we are apt to overlook the importance of their discovery, and the peculiar links which they form in the chain of improvement. Who their inventor or their inventors was or were, we are not in a position to say; but it is manifest they were all included in the mills of Vitruvius, erected on the canals and rivers of Italy, in the time of Augustus Cæsar. There is also reason to believe that in the Vitruvian mills the nether millstone was occasionally made the runner, and the upper millstone the bedstone, as circumstances required; for at that time the Romans had both the under and upper methods of gearing, in actuating the runner. And, as the ingress of the grain was invariably at the eye of the upper millstone, and as the eye of the nether millstone was of necessity closed, to prevent the grain passing down through it, it follows that the eyes of both millstones were closed, according to the position which they occupied, the eye of the bedstone being closed when it is the nethermost, and open when uppermost, the eye of the runner being also closed when it is nethermost, and open when it is uppermost—methods of closing the eye which have come down to our own times.

This, however, is not exactly what is meant by closing the eye of the runner and of the bedstone, as the case may be, in the specifications of several modern patents; and, therefore, the mechanical facts of the case require to be somewhat closely scrutinised.

In the old mills, the grain from the shoe fell into a short feed-pipe, which carried it from the top of the cover, or casing, of the stones down to the eye of the runner; and in not a few mills there was no feed-pipe at all, the grain falling directly from the shoe into the eye of the runner. But the best-constructed flour-mills had a short feed-pipe, the stones being closely cased, so as to prevent the escape and waste of stive or dust, and also to prevent the reactionary movements of air-currents in aerating the grinding surfaces of the stones, and also in the removal of the flour down the "shutes," or spouts, as we shall afterwards show more at length, in its proper place. And when the supply, in feeding, came to be regulated by the modern "feeding-cup," feed-pipes became more essentially necessary, as will also be shown under its proper claim.

Between these feed-pipes, however short or long, there was necessarily, or, more properly speaking, generally an open space around, between them and the inner edge of the millstone forming the eye of the runner; and when air was forced in by artificial means through both the eye of the bedstone and eye of the runner, as in No. 10,165, and eye of the runner in 11,239, it escaped, and rose upwards through this open space, instead of passing along with the grain between the stones. And what is now meant by shutting the eye of the runner or bedstone is, the closing of this open space by means of an air-tight plate surrounding the feed-pipe, &c.

The expression, however, is a very improper one, as the name of every mechanism should express, at least in general terms, the peculiar function which it performs; and besides this, the eye is not closed, as there is still an escape left for the air to pass upwards, as will subsequently be shown. And were this the least omission into which modern inventors have fallen, and are yet falling, it might prudently be passed over, but the first claimant to this peculiar novelty is No. 11,084, 1846, and the second is No. 11,342, 1846. The latter claimant falls into a series of still greater errors, showing the little attention he had previously paid to the works of Vitruvius, and other engineers, millwrights, and millers before him to a subsequent patent. By a disclaimer to his patent of 1849 he sets himself partly to right with the public; but by calling the bedstone the runner and the runner the bedstone, or rather not being aware, when he drew up either specification, that there was no novelty in making the nether millstone the runner, and hence closing the eye of the runner, as already shown, and the upper one the bedstone, he falls into the ditch by describing the fixing of the upper stone, and the rotating of the lower one as a novelty never heard of, and hence nameless before; so that his claim relative to shutting the eye of the runner is not only null and void by reason of want of novelty and fact, but also by reason of imperfect description. True, in 1849 he shuts the eye of the runner, but this he is forced to disclaim; while in 1846 it is not shut at all. Several subsequent patentees have fallen into similar errors, both as to the claims which they make and the terms in which they are expressed; but these it would be superfluous to mention.

The purpose which the peculiar mechanism thus invented and claimed serves, the reader will thus perceive, is to have only one ingress for the air and the grain in feeding, when both pass through the eye of the upper millstone, which is the original or primary plan of the mills of the ancient Chaldeans, Egyptians, Hebrews, Greeks, and Romans, whether worked by hand or driven by wind, water, or animal power. The eye of the Hebrew runner as represented in Calmet's *Fragments*, and the eye of the mill dug from the ruins of Pompeii, are furnished each with a revolving hopper or cup, hewn out of the stone, as already stated, which effectually closes the eye of the runner as above; but the large milstones must have had short wooden cups or funnels for feeding the millstones from the pendant spout of the grain hopper above. And numerous hand-mills with revolving hoppers have been made and proposed in this country. Herbert, in his *Engineers' and Mechanics' Encyclopædia*, for example, suggests an improvement on the old "rowing mill," in which the eye of the runner is closed by a revolving hopper, which, according to the drawing, has a plate projecting over the open space between the feed-pipe and the stone forming the eye of the runner, so that the pendant feed-pipe of old examples, in at which air was forced by fans working in this hopper, would prevent the escape of the air upwards between the pipe and eye of the stone. The French military mills were fed by cups, and hence the eye of the runner and of the bedstone were each closed. But Rustall (A.D. 1800) feeds in between the eye of the bedstone and periphery, the space between the feed-pipe and eye of the stone being closed.

In specification No. 8,647, A.D. 1840, which is declared to be an improvement of the French military mills, horizontal burr-stones being used instead of vertical steel plates, the nether-millstone is the runner working horizontally, and the eye of the stone is represented as closed, similarly to what it is afterwards in the examples of 1846 and 1849 already quoted; while the grain and air enter by one passage through the eye of the upper millstone. The same remarks apply to No. 6,536, A.D. 1834, in which the lower millstone rotates. In No. 7,594, A.D. 1838, the eye of the runner is virtually closed—as in No. 11,084, A.D. 1846—by a revolving funnel, but an opening is left for the air to escape between this funnel and the distributing plate, which the latter closes—this latter being the first specification in which a special claim is laid to the principle of closing the eye of the runner. In point of fact the following three prior patents on the blast-fan principle—viz., No. 9,876, A.D. 1843; 10,165, A.D. 1844; and, 11,239, A.D. 1846; and 11,084, A.D. 1846, on the exhaust principle—as effectually close the eye of the runner, to prevent the escape of the air, as does No. 11,342, by simpler and less expensive mechanisms, although not so effective. On the exhaust principle, the number of prior users who draw in at the eye of the upper millstone an artificial current of air through the feed-pipe along with the grain, and which virtually close the space between the feed-pipe and the inner edge of the grinding surface forming the eye of the stone by means of the casing, as the American communication, No. 11,084, 1846, would do more than fill a column of the *Mark Lane Express*, as will subsequently be shown in detail. In short, under the old statute, the manner many intelligent inventors fall into faulty mechanism specified, described, illustrated, and claimed with an air of so much self-satisfaction and disrespect to the claims and rights of prior inventors, and the milling trade generally as prior users, is rather amusing and edifying than offensive. Disclaimers, however, have been compared to two-edged swords—cutting both ways, and doubtless so they do; for they not only expose the ignorance of the patentee, but in nine cases out of ten spoil the validity of all that remains undisclaimed in the specification. This is very forcibly the case with No. 12,636, A.D. 1849; and its disclaimer for what remains has more right to be set aside by the milling trade and the public as null and void by reason of want of specified novelty, than what has been abandoned by the patentee himself, as will subsequently be shown. The principle of closing the eye of the runner and bedstone was thus public property prior to the above patents of 1846, and therefore open to the adoption of several prior patents, in which the forcing of air between millstones by fans is specified, and also by the American exhaust or flour pumps, &c. In point of fact it must be held as included in their claims, as they specify the application of their improvements to all prior users. Unfortunately the specifications of the patents under the old statute are almost all of a more or less grasping, ambiguous, and even indefinite character, a great deal more being generally claimed than warranted by the improvements made. It may therefore be thought that we have been somewhat severe on No. 11,342 and 12,636—the production of one patentee, but the reverse is true; for mechanical facts must be plainly stated, and these we have stated in the most favourable light for him. Thus, in comparing him with his predecessors in this respect, he is more clear, definite, distinct, and even less grasping in his claims than they are; while he has done much more than they did in the improvement of the hot-grinding system of milling, as will subsequently be shown. His misfortune is also theirs—the claiming of principles instead of special mechanism, and the combination which such special mechanisms form; and his disclaimer clearly proves that this arises from a too limited practical knowledge of mills and milling, even in 1849. All his predecessors above quoted might also have disclaimed on other heads, as will subsequently be shown, and probably so they would, had their patents been worth it; for, practically speaking, comparatively useless patents don't require disclaimers.

We have examined the above four heads (including claims 4, 5, 6, and 7,) in the light of the future rather than in that of the past. We have done so, because at present the course of progress appears to lie in the improvement of old mechanisms and practices whose merits in principle are not being sufficiently attended to, acknowledged, and respected by inventors and patent-agents; so that useful improvements in special mechanism are virtually being sacrificed, in consequence of patentees claiming principle instead of special mechanism—an objectionable line of procedure, which is giving rise to much useless and expensive patent-making and law proceedings, together with much obstruction to permanent progress. To avoid repetition, the faulty mechanism and shortcomings of the specifications above referred to, relative to closing the eye of the runner, will be pointed out under Feeding Apparatus and Aërating the Millstones, these being their proper places.

PROGRESS IN THE AERATION OF MILLSTONES FROM 1852 TO 1865.

In the last paper it was proposed (1) to review the principal physical data involved in aërating millstones; (2) to notice the several plans adopted in cooling and aërating millstones; (3) to glance at the erroneous course into which a large number of the pioneers of progress have fallen in connection with this branch of milling; and (4) to consider the course which millers have it in their power to pursue without infringing the patents of those who have left the right line of improvement, apparently in the hope of reaching the winning-post more easily on bye-roads on either side.

Of these four heads the first has been nearly disposed of, so that the latter three will form the chief topics of this paper, with what remains of the first.

Our remarks at this time on the physical data involved in the aëration of millstones, including the removal of the flour therefrom, may thus be premised. The chief chemical topics already noticed are (1) moisture or the heated breath in the millstone case, so much complained of; (2) temperature; (3) the condensation of steam; and (4) how the specific gravity of the wheat and of the moisture it contains is each affected by grinding and by the absorption of caloric. The expansibility and compressibility of the air in the millstone case will be noticed further on, and in detail, under a different heading, *viz.*, *Function of air in grinding*, No. XXVIII. How far the electric fluid is excited in grinding is a question which has hardly, up to this date, been experimented upon, and therefore we shall not enter upon the details of its philosophy; and, with all due respect to those who performed the extensive and invaluable experiments of the last century, so as to determine the action of water-wheels, the proper velocity of the runner, &c., &c., the whole of this question requires further experimental investigation, under the greatly-improved state of science and scientific apparatus of the present day, as compared with the past, when the old experiments were performed, before a satisfactory solution of it can be obtained, more especially as regards the chemical and other data at issue. The microscopic investigation of the wheat and flour follows: it chiefly belongs to the dressing of the grain and flour, but the mechanical effect produced in the grinding requires to be closely attended to; and although colour, handle, taste, and smell may enable the miller to arrive at certain practical conclusions, the microscope is nevertheless absolutely necessary to assist the eye and the hand, in order to determine the true state of things in a manner suitable to the present requirements of milling science; for excessive grinding may so minutely subdivide the bran and pollard, or greys and flocculent stive, as to give them the appearance and handle of the fine flour of the kernel, and thus deceive the organs of vision and touch. It is also a well-known fact that excessive grinding produces not only mechanical changes, but also chemical changes, often to such a degree as to impose upon the organs of taste and smell. Now, it cannot be denied that science is in a much more advanced state just now for the experimental investigation of these topics than it was a century ago. In short, the experiments of last century were not made with aerating apparatus and other modern improvements. Hence the conclusion.

(2) The old plans adopted prior to 1852, noticed in previous papers, for removing moisture and keeping down temperature, are those which have engaged attention subsequent to that date up to the close of 1865, and down to the present day are still the subject of patent rivalry. Drying wheat in granaries by a current of heated air, for example, or a current of dry air, as proposed in the early part of last century by Dr. Hale, Duhammel, and others, have of late been proposed under various patented processes for the removal of moisture from wheat and other grain. The old Carthagenian practice of decortication, approved of by Mago, the brother of the great Carthagenian general Hannibal, and recommended to the Romans by Pliny in his time, and by the late Francis Duke of Bedford to a committee of the House of Commons in 1801, has again and again been patented and proposed during the last fourteen years as a new-fangled novelty in the art of milling! True, the ancient Carthagenians and Romans dried their moistened wheat and barley in the sun after it was decorticated; while in this country, at the commencement of the present century, moist decorticated grain was dried on kilns; but just so was moist decorticated grain dried in England, Gaul, and Germany, in the days when Pliny and Mago wrote on *Mills and Milling;* and just so have our modern pioneers made their would-be discoveries. "What, then," it may justly be asked, "is the extent of our modern improvement in this direction?" The question is a very problematical one in a professional sense; for while much that is novel may be acknowledged as improved in the details of mechanism, and in not a few chemical processes also, we aver, nevertheless, that the work performed is inferior to that done by the practice of the old Roman and Carthaginian millers, if not also inferior to what was done in Gaul and Germany in Pliny's time. Real progress, therefore, in the drying of moist grain is evidently an open question for the practical solution of the future.

It has been shown last month that a certain degree of moisture has a tendency to keep down temperature in the grinding, and *vice versâ*, the grinding of dry grain producing extra heat, the velocity of the runner in each case being the same. Mago and Pliny do not go into the details of grinding sufficiently minute to inform their readers whether the Carthagenian and Roman millers ground their decorticated grain with more moisture than they did their parched and unmoistened grain, or whether they worked grain of different degrees of moisture with different velocities of the runner. The reports of the practice pursued at the commencement of the present century likewise pass over the chemical and mechanical facts of the case at issue almost wholly unnoticed, while in the patented discoveries of the last fourteen years, or rather from 1852 to 1865—those more immediately under consideration—it may not inaptly be said to be nearly all groping in the dark with inventors, or, at best, in cloudy moonlight, patentees generally manifesting in their specifications and claims very little acquaintance with the old practices above referred to, or the philosophy of milling generally.

The grand problem of problems, however, to obviate extremes of all sorts which has been, and still is, with some little deviation, put forth, is the old American and French practice of drawing and blowing in cold or heated air between the grinding surfaces of the millstones on the one side, and a sucking out or blowing out "bad breath" and everything else from the millstone case on the other side. The practice was first introduced into this country without patent, but the date of introduction is not very certain. Between 1840 and 1850, however, it was patented in various ways, patentees, generally speaking, being apparently ignorant of what the millers of the United States and of the continent of Europe had done in the pneumatic solution of the problem. When fanners were first introduced into this country, the manner they disturbed the equilibrium of the atmosphere in the mill gave rise to the adoption and use of various textile fabrics for filtering the atmosphere, so as to keep in the stive, &c., and likewise to obviate back-draught in the fanners.

The Chinese are said to be the first and true inventors of fanners, and most probably they also invented the filtration of the atmosphere as above; but be that as it may, the discovery was made a second and third time before 1850, and many times since then up to the close of 1865!

The object of drawing in or blowing in cold air between the grinding surfaces of millstones, is twofold according to the popular but erroneous notions of millers at the present time: first to keep down the temperature, the caloric being carried off by the air; and second to keep, by means of the elastic and expansive character of air, the broken grain being ground "alive," so to speak, and thereby facilitate grinding. It has been shown that heat is the cause of steam. If the temperature of the grinding surfaces and flour between them could therefore be kept down to a degree below what would produce steam, the heated breath and pasting in the millstone case and spout by condensation would consequently be obviated. But this desideratum, we aver, has not yet been attained; while the air thus forced or drawn in between the stones always contains less or more vapour, the atmosphere in some cases being heavily loaded with moisture. Hence the hot moist breath in the millstone case, and the opposite theory of blowing in heated air to dry the grain &c. or produce steam, and to prevent the condensation of steam thus formed, pasting, &c., when this moist breath or steam and stive come in contact with the cold surface of the millstone case, mill-eye spout, &c.

In the American plan of aëration, patented under 11,084 A.D. 1846 in England, both the cold and heated air were drawn in at the eye of the upper millstone, and both were also exhausted from the mill-eye spout, or two mill-eye spouts, by a perfect vacuum produced by two flour pumps. But, as previously stated, the Americans had blast-fans for blowing in both cold and heated air at the upper stone, and also into the millstone case, so as to drive or clear out its contents as fast as emitted from the stones; so that both these plans of aëration are now public property in this country, and therefore cannot honestly be claimed in any patent. As such they have justly and fairly been used by many patentees since 1845, more especially the cool-air plan. In point of fact the cold air plan having been used before it was patented in this country, it follows that all patents laying claim to it are null and void, both before and after 1852. Such being the facts of the case, both from a practical or milling and patent point of view, it is not very easy to account, in the spirit of "Live and Let Live," for the unprecedented amount of vexatious and expensive litigation that has taken place under this head since 1849. That the Milling Interest and the general interest of the Public have both been sacrificed in Court, and the Wheel of Progress greatly retarded, is manifest; but then on the other hand, why have millers, the Bar, and the agricultural press for the public, allowed patentees to blow stive in their eyes for fourteen years? Are patentees so ignorant of the science and practice of milling, all the while, as to believe that they themselves were really the first and true inventors of the above cold-air plan, and also of the old stive-room or atmospheric filtration in mills in the manner claimed? We have much less difficulty in justifying and even in exonerating, in a general sense, the conduct of such patentees, than we have in approving of the conduct of millers. Civil engineers, as a class, are proverbial for their ignorance, and therefore the obvious duty of all sections of the public press—whose function is to advocate the progress of physical science—is to let the schoolmaster abroad amongst patentees and millers.

(3). This naturally brings us to notice the errors into which patentees, millers, and the public have fallen, in the various plans proposed, and reduced to practice, for the aëration of millstones, and the removal of the flour therefrom, since about the commencement of the last century, when the improvement of mills was publicly taken up and discussed in the columns of the *Gentleman's Magazine*, including the ventilation of grana ries and the process of drying grain. Thus, in vol. xiii. p. 503, we have a drawing and description of Friewald's ventilator and process of drying; in vol. xvi. p. 315, Dr. Hales' method already quoted; in the same volume (xvi.), page 640, December, 1746, there is a drawing and description of "a machine for rubbing, cleaning, and winnowing corn all at once;" in vol. xxviii. p. 26, a drawing and description of a hand-mill for grinding grain; vol. xxxv. p. 239 (September, 1765), notice of "a model of a grinding-mill brought from Paris," and so on. But the real struggle in the race commenced when fanners, decorticating mills, and the method of filtering the dusty atmosphere of the mill were brought over from Holland. Although much progress was made, it required nearly a century to take "the wing" from Mercury's heel, so to speak, and to place it upon the periphery of the runner, under Hunt and Cliffe's patent of 1799. We believe, however, that vanes and brushes were placed upon the runner before this time; but we have no authenticated record of it. But from this date down to 1865 the number of contrivances of this kind for exhausting and cleaning the millstone case of "bad breath" is legion; and in very few of them do we find the slightest attempt made to comply with the physical demands of science. One is almost tempted in some cases to assume that the grand object in view was to produce more heated breath in the millstone case, and more floating stive and steam in the mill! The facts of the case go far to warrant this conclusion, so that the whole may justly be termed a mass of mechanical rubbish, the offspring of conceited opinions; and yet, for all this, there is something sound in principle in most of them; for it is possible thoroughly to ventilate the millstone-case by means of a vane upon the runner, provided both millstone-case and vane are constructed and used according to the requirements of the laws of physical science. Some of our pioneering readers will no doubt reply: "If my patent project is right in principle, how have I erred in special mechanism?" The answer to this question, however, belongs to our next head; and therefore, to avoid repetition, we shall return to it farther on. The errors we have to point out under this head, in order that they may be avoided for the future, are those which are not founded on sound principles, or, in other words, claims which are erroneous both in principle and special mechanism, or which have no useful application, but the contrary.

The errors in question may be reduced to two kinds: first, claiming principle under the erroneous notion that something new is attained, while in point of fact novelty is wanting; and second, new projects that are sound under certain conditions not yet attained, but the reverse under the conditions of the practice in use. We might quote many, but a single example under each kind will be sufficient for illustration.

The stive-room and plenum-exhaust—or "regulated exhaust," as it has been falsely termed—of patent No. 12,636 (A.D. 1849) may be taken to illustrate the first. In this patent, the patentee evidently thought, at the date of his patent, that he had really discovered something new—not embraced in the Dutch, American, and French plans with which by this time he must have been familiar—*i.e.*, that exhaust-fans had been previously used both with and without blast-fans. In point of fact, he acknowledges as much in his specification, which throughout is inconceivably confused and opposed to scientific rule. True, at the time he drew up his specification he was not aware that, at a subsequent time, he would have to disclaim his first claim; and, unfortunately, he does not disclaim all that the first claim covers; for, quoting his disclaimer copy, third edition, he specifies: "I do not, therefore, claim the principle" (*i. e.*, of exhaust), "except when worked in combination with a fixed upper stone." Now, before the date of his patent, an exhaust had been worked with a fixed upper stone, while it was included in a prior patent, No. 11,084, 1846: hence the conclusion. It is very evident, therefore, that the above quotation does not embody the real gist of what he believed to be his discovery. This he himself corroborates in the next paragraph, when he says: "And this part of my invention relates only to sucking away the plenum of dusty air forced through the stones, and not to employing a sufficient exhausting power to induce a current of air between the millstones without a blast—this having before been practised, as above mentioned." This appears to apply to the French exhaust introduced into this country in 1845, referred to in "Morton's Cyclopædia of Agriculture," formerly quoted, or else to the American project of 1846. But the Americans before this date were feeding in the grain and blowing in air at the middle of the upper stone, the lower stone being the runner, and exhausting it by pumps and fans; and the force of the influent current of air, under the above American project, patented in England before the date of the above patentee's patent of 1846, was greater than the influent blast of his patent of 1849. The American exhaust was also more effective than the English exhaust; so that, as above enumerated, the gist of the aerating claim in question, after he lodged his disclaimer, is that of a plenum-exhaust—a method of exhaust which he has since acted upon as a novelty, although the contrary is fact, as the sequel will show.

But what is a plenum exhaust? At this season of the year an old riddle or enigma may be left to answer this question. Thus, fill a bottle with air, and then, by means of an exhaust pump, draw off half the contents of the bottle, and the bottle will nevertheless remain full, *i. e.*, plenum. Draw off half the remainder, and the bottle still remains plenum; and so on. Such is the expansibility of air, that it always keeps the bottle full. More need not be said to show the intelligent reader that all the above prior exhausts were as much "plenum exhausts" as the one in question—hence the error of the patentee; and that from the nature of fluid pressure, they all, less or more, remove the counteracting pressure of the heated air in the millstone-case against the effluent current through the stones, and hence were the common property of the public. The attempt recently made to designate as a novelty this plenum exhaust of 1849 "a regulated exhaust" falls to the ground as untenable; for all the prior exhausts are regulated exhausts, and some of them, as the American flour pumps, more successfully so than the one in question—hence the general conclusion.

The second kind of errors fallen into may be illustrated by the proposition of cooling the millstones and case, &c., by cold-water, for such would condense the steam in the millstone-case &c. under existing ciscumstances; and when a method is discovered of keeping down the temperature to a degree below that which produces steam, then the cold bath will be superfluous, unless in so far as it forms part of the above discovery not yet made; hence the practical conclusion under this kind of errors.

(4). We now return to the miller's question—how best to improve the aëration of his millstones, without infringing anybody's patent? and before a practical or scientific answer can be given to such a question, many chemical and mechanical topics have to be determined at the bar of experiment. We can see clearly how the dusty air in the millstone-case, bolting rooms, and mill generally, can be got rid of, without infringing any patent, far more successfully than has yet been done, and the whole mechanism of the mill greatly simplified; but that does not solve any one of the chemical, mechanical, and microscopical questions formerly stated; and all these require a practical solution before the work of improvement can be successfully based upon a permanent foundation. In short, the whole subject of manufacturing and aërating millstones and of grinding, &c., requires to be taken out of the giddy regions of opinion, and to be experimentally investigated, as formerly suggested, so as to determine the facts at issue, in accordance with the laws of physical science; and this, we may add, is obviously a national undertaking of such importance and magnitude as to demand the co-operation of Parliament and the public. Into the details of the miller's question our space will not permit us to enter further at present, but they will be taken up and discussed in subsequent papers, in which the true function of air in grinding will be pointed out, along with the various plans of cool grinding, &c.

GRAIN DRESSING MACHINERY, FEEDING APPARATUS, &c., 1852 TO 1865.

In previous articles it has been shown that the preparation of grain for grinding formed a very important branch of the art of milling in ancient times, more so than it did at an after-period. And if we are to place any reliance upon the Patent Office publications of this country and those of the United States of America, the pioneers of progress conclude that in this department of the mill there was at the close of 1852 room for improvement, a very large number of new patented propositions having been enunciated, and not a few of them reduced to practice. Prior to the introduction of fanners, the corn, as it came from the farmer, often contained much foreign matter, which compelled millers to have recourse to various processes to effect its removal. And even after fanners were used in most mills, farmers were slow to adopt them; and when they did, how many of the old fanners, the first ever used upon the farm, were rattling at work at the close of 1852? To the antiquarian there may be something highly interesting in these relics of the last century, but their use is attended with a very heavy loss to the country, to say nothing about the pocket of the farmer, while they are anything but encouraging to the pioneers of progress. Fortunately inventors are not a class of men who take the pet at conduct of this kind, but the contrary; for the ingratitude of the general public only stimulates them to greater enterprize, so as to triumph over everything in their way. In the darkest days of the past, there were always an exceptional few, not only willing, but anxious to go-ahead in the march of improvement; and since the International Exhibition in Hyde Park of 1851, there has evidently been a greater willingness amongst farmers and millers to join the race of progress than there was prior to that period. And this applies in an especial manner to the dressing of grain for milling purposes. There are, no doubt, a very perceptible number of old-fashioned people here and there scattered over the provinces, millers as well as farmers, who are walking very circumspectly in the footsteps of their ancestors; but they are fast dying out, leaving their farms and mills, it is to be hoped, to a more enterprizing generation.

Since 1852, chemical and microscopical science has done much to encourage and stimulate progress in this branch of milling. Before 1852, both these sciences had thrown a flood of fresh light upon the scientific investigation of corn, sufficient to enable farmers and millers to see things as they never saw them before, and to be guided accordingly. Hence the source and variety of new ideas that have arisen upon what may be termed old practices and even old failures, and the discoveries made to effect greater economy by improved dressing-machines of every kind, in order to comply with the advances made in both these auxiliary branches of science.

The dressing of grain is equally interesting to the farmer, corn merchant, and miller; and whether they adopt them or not, it must be admitted by them that several important improvements have been made within the last fourteen years, and that they have been sufficiently tested at the bar of practice to determine their true value. Corn-screens for equalising the sample as well as for the removal of small seeds, and the like, may be quoted as an example, and of these we have rivals as to which is the best and most improved machine, questions which do not belong to our province to solve, much less to pit them against each other in the columns of the *Mark-Lane Express* in a general notice of this kind as to the advances made in the race of progress, from a scientific point of view; for physical science excludes opinionative conclusions of this kind. Corn-screens have certain well-known functions to perform, and as experience has proved the new ones superior to the old, not only the practical but the scientific conclusion also, so far as we are concerned, may be left each to pronounce its own award. As to the scientific question of mechanical progress involved, no doubt the advances made in this class of machines are subject to further improvement, more especially in a scientific sense, a truism which the inventors of such improved machines will rather smile at than deny; and he would be a blind leader of the blind who would presume to say which of all the rival corn-screens now made are subject to the most improvement. In short, so long as useful discovery is leading the way onwards in the right direction, the prudent course in a general notice of the progress of science, with a view to future improvement, is to give inventors every encouragement by the general adoption of their improvements. It is only when they get off the line, or introduce old things as modern novelties that their conduct calls for close criticism.

In scouring and cleaning machines improvements have also been made, but chiefly in special mechanism. In this class of machines the revelations of the microscope have served much to stimulate improvement by bringing into view a world of little bodies, more destructive to wheat than either weevil or smut, the old enemies of the miller—unseen little bodies, that cling to wheat and other grain for their daily food with a degree of tenacity which requires hard rubbing to remove them. Our ancestors either parched their grain or put it through between millstones set sufficiently far apart so as not to grind, but the process was that of decortication, thereby often removing with the husk portions of the outside of the kernel, which contain the best of the flour. Hence the heavy loss. Wood was substituted for stone, but was found defective. Revolving cones and cylinders or rollers covered with cloth or leather were used upwards of a century ago in various ways, to scour and polish the wheat as it were, so as the better to preserve it in the granary, or fit it for immediate grinding; but the golden mean between the two extremes—*i. e.*, a sufficiency of friction on the one hand to scour the grain thoroughly, and tear, wear, and expense on the other hand—does not appear to have been discovered. Whether vulcanized india-rubber, now being substituted for the wood, cloth, and leather of the old machines, will prove itself to be the golden mean, is a question which experience must be left to answer. And, besides the mechanical questions of tear and wear and friction sufficient to scour the grain, there is also involved a chemical question which ought not to be overlooked, both as to the effects of heat upon the material itself—heat produced by friction—and gaseous or other chemical products produced by heat and friction.

In another class of dressing machines, friction, or the work of cleaning, is effected by knives, arms, brushes, or other devices of this kind, revolving in conical and cylindrical cases through which the grain passes by its own gravitation in the scouring and cleaning process. An endless variety of propositions of this sort have been patented since 1852, both in this country and in the United States of America by our transatlantic cousins, of which a large number has been reduced to practice. In principle there is very little that can be called novelty; but as regards special mechanism the number of new devices are almost incredible, while the quality of the mechanism proposed shows a marked degree of progress in the art of construction, as compared with the workmanship of old machines.

Improved quality of special mechanism calls for a separate notice, for many of our early inventions in this class of machines, as in almost all other classes, were abandoned on the grounds of defective quality in constructive workmanship. To lose sight of this, as is too often done, is to confound one branch of discovery with another, thereby denying to the inventor of a mechanical principle what is justly his due, by giving it to a subsequent inventor, who, not aware of the first discovery, has discovered exactly the same thing, and whose success arises from his project having fallen into the hands of a manufacturer for reduction to practice at a period when the art of construction had been greatly improved. The latter has no right even to claim in his patent (or project without a patent) special mechanism, such being due to the manufacturer who makes his machine; and yet he claims both principle and special mechanism, and receives public credit for the same because of his success. Many examples of this kind might be quoted in the class of machines under consideration between 1852 and the close of 1865; but, as we are now chiefly discussing principle, for the sake of future progress, and not special mechanism—mechanical and chemical principles which are now public property—such quotations would be inconsistent, and, besides, they would obviously be considered either finding fault with or advertising somebody's hobby-horse—or both, perhaps—alternatives we wish to avoid as far as possible.

Cleaning grain by washing and drying involves another class of machines that claims a passing notice. The principle is as old as the days of Virgil and Homer. The successful use of centrifugal drying machines in our laundries has aroused the inventive genius of several patentees since 1852 to try their luck in the mill by washing and drying grain by such means. The idea is not unworthy of a hearing, but of the success attending its reduction to practice the less said perhaps the better. When grain-laden ships become water-logged, or when the miller is flooded out of his mill, and much corn immersed in water, the drying of such corn by centrifugal machines becomes a question of practical utility. Grain thoroughly steeped, however, as in the old process of hulling wheat, or of making pot barley, would, we aver, be partially decorticated before it was fit for kiln-drying; but in the estimation of some members of the go-a-head school, this would rather be an improvement than the contrary.

Machines for decorticating grain on the dry and wet processes are old inventions—subject, of course, to much improvement; and so, since 1852, numerous propositions have been enunciated in favour of progress. Chemistry has also entered the mill with the good intention of assisting the miller, by using certain weak or much diluted acid solutions, in which to steep or moisten the wheat, the object being to separate more effectually and speedily the husk from the kernel, than by the use of mere water. In the moist plan of blanching wheat, the grain absorbed too much water before the bran was sufficiently loosened for removal, and it has occurred to some of our Gallic neighbours that by the use of certain harmless chemical preparations, an improvement in this respect would be effected; and since 1852, or in 1863, the project was patented in this country, along with five other different decorticating propositions, being five decorticating patents for that year.

Long ago salt water was successfully used in the making of pot barley, and we believe it was also used in the blanching of wheat in the experiments made about the commencement of the present century. From time immemorial seafaring people have been familiar with the penetrating character of sea water, and the rapidity with which it moistens grain and everything else. The principle is thus public property; but how far it can be successfully applied is a question whose solution, we aver, must be left for future experience to solve. One patentee in 1865 proposes decorticating moist grain by passing it between wooden grinding surfaces covered with some elastic material—the hulling-mill being on the old Dutch horizontal plan, first introduced into Scotland by Meikle; and another in the earlier part of the same year (1865) proposes decorticating dry grain by making both stones, or the stone and case, rotate one way, but the one at a greater velocity than the other, so as to reduce the injury to the grain to a minimum. But the novelty of the project may be called in question, for the rotation of both millstones in grinding and hulling is a very old practice.

Were the grains of wheat, or rather the kernels of the grains, spheres, dry decortication would have much to stimulate invention in perfecting machines for the work; but the reverse being the form of the grain, which on one side is deeply furrowed, it follows that the decorticating process must either be imperfectly performed, or else a sacrifice of less or more of the finest and strongest of the flour must unavoidably be sustained. Moist decortication obviates this loss to a very large extent; but in our climate the necessity of kiln-drying, and the harm generally sustained thereby, is virtually a practical barrier to its general adoption; so that the moist plan is beset with as many practical objections as the dry one. To the ancient Romans and Carthagenians, who dried their grain in the sun, the moist system had many things to commend it, which it had not, and has not, to the millers of this country. At the same time the moist decortication of wheat has at the present day many successful go-a-head advocates, who are racking body and mind to solve this problem successfully, so that the wheat as it comes from the farmer or corn-merchant shall be fed into the moistening mill, pass through the decorticating mill, the drying mill (or whatever future discovery may call it), the grinding mill, and the bolting mill, from which it is proposed to come ready for the baker, the whole series of mills forming one manufactory. The idea is legibly enough to be seen already looming in the distance by the indomitable genius of modern discovery. Some even add the thrashing and dressing machinery to the one end of the above series, and the bakery to the other. In point of fact, all this has been patented long ago by our clever Yankee cousins. But Science in harness with Practice has not got this length yet, and therefore we must, on the other hand, return back to the mill, purposely to remind "Dusty Coat" that the days of impossibilities are gone by.

In the conveying of corn to and from the granary, and in the feeding of millstones, we have little or no novelty to chronicle in principle. The pneumatic conveyance of corn is an old American proposition, and since the opening of the first pneumatic railway in this country it has from time to time been talked over as a future practicability, and of late several projects have been patented; but, so far as we have seen, the novelty of their inventions is very problematical. In feeding millstones we have nothing further to add.

FLOUR DRESSING, COOLING, &c., FROM 1852 to 1865.

Under the Patent Law Amendment Act, 1852, a large number of patents have been applied for, in connexion with this branch of milling. Of the three hundred and thirty-nine applications, including all sorts under the "subject matter" indexes of the Patent Office for mills and milling, there are very few specifications that do not include something or other in favour of progress in the dressing and cooling of flour. In the Patent Office publications of the United States of America, "Class XIII.," the finger of progress points in the same direction, there being a close similarity in the footsteps of Discovery in the two great English-speaking nations of the world, as if millers on both sides the Atlantic were animated in the race by a common spirit of enterprise.

There are still a great many old-fashioned dressing-machines in the flour department of some mills; but, we aver, the last fourteen years have seen a greater number of new things introduced than any previous period of the same length. General progress must therefore be reported, although we are not prepared to boast of any great discoveries having been made since 1852—discoveries involving new principles—the immense number of applications being for special mechanism. Of these there are, as usual, a great many *twins* and triplets in the flock, and an equally large number of old things that had been patented several times before, such as a current of air thrown into the cylinder and other auxiliary apparatus for forcing the flour through the sifting surface, as also in the conveyance, cooling, and economy of the flour, stive, &c. A large number of applications of this kind only receive provisional protection, as already stated generally, the applicants finding their projects anticipated, after paying the £5 Patent-office stamp and their patent-agent's fees and expenses. But a great many were sent to the Great Seal with very little novelty in their details of special mechanism. At the same time, when the new patents are compared with the old, it is very interesting to observe the improvement in the former that have really been made, and the almost unlimited number of details into which the special mechanism of any one machine may be subdivided. It is this which gives rise to the immense number of patents—a number which in itself is not only harmless, but highly advantageous to the manufacturers and the user, provided patentees would specify clearly the improvements in special mechanism which they do make, and confine their claims to the same.

During the first half of the present century the waste of the stive in the mill was a subject of general complaint, and between 1800 and 1852 various propositions were enumerated and reduced to practice, in order to obviate this waste by the filtration of the stive-loaded atmosphere of the mill, purposely to economise the stive and get rid of the steam, &c.; and from 1852 to the close of 1865 several patents yearly have been applied for, to effect the same object more successfully.

There is something highly interesting in this race of economy, when the various propositions are examined from a scientific point of view and compared with the old American and French plans previously in use. And the race is none the less attractive that since the enunciation of a separate stive-room in 1849, although the proposition itself is an old one, pioneers with hardly an exception to the contrary have been off the true line of progress, so that it would serve no useful purpose to follow them in such a course. We have in former papers stated that millers, sooner or later, would have to go back and take up the American and French practices for their improvement, and we shall now proceed briefly to discuss the principles upon which such practical conclusions were founded.

There are two general ways by which flour is wasted, and both these have long been a source of grievance to the miller, and very many plans have been tried to obviate both. The one is the stive or impalpable dust that pervades the mill, and the other is the dust and fragments of the kernel that adheres to the bran. The loss in each of those cases has given rise to a number of patents during the last fourteen years, besides innumerable plans not patented, to which practical millers have resorted. And what merits a special notice is the fact that the latter (millers) are generally a considerable distance a-head of the former (patentees)—the greater number of the newly patented projects in question having been anticipated by prior use. Thus it is upwards of a century since the filtration of the atmosphere of the mill from the stive was in use;

and yet without regard to these old practices several patents under the old patent law and a greater number under the new statute have been applied for, and obtained, as if nothing of the kind had ever been done before. The same may be said of the abstraction of "flour, shorts, and dustings" from the bran, for which two patents were obtained in 1853, and several more since, much of these new projects having been anticipated by old practices. There is, however, much patentable improvement in the special mechanism of the modern plans of carrying out the old practices, and had patentees confined their claims to such special mechanism, their conduct might have been passed over without unfavourable criticism, granting that their propositions were out of the line of progress, and hence superfluous. In one respect this sacrifice of principle applies with equal force to the miller as to the patentee, the prior unpatented practice being erroneous in principle as well as the subsequent patented ones.

Passing from the political and patent-law questions at issue to the chemical and mechanical, the first problem for solution is the erroneous nature of a stive-room, ancient and modern, *i.e.*, the old, unpatented practice of the miller, and the modern patented problem of the patentee. What is wrong in principle with them?

In answering these questions, the reader will bear in mind that the object we have in view is twofold, the first and chief being future progress, and the second the experimental and scientific investigation of the subject, so as to ascertain physical data not yet determined, such as the temperature and degree of moisture of the flour, and air in the millstone-case, shute, stive-room, &c., as formerly suggested—a more correct analysis of the wheat and flour as to the per-centage of water and odorous properties lost in the grinding, with any other chemical changes that takes place; and along with this chemical analysis a searching microscopical investigation requires to be made in order to ascertain the per-centage of "greys" or clipped bran, and flocculent stive in the flour, together with the quantity of dustings, shorts, and kernel that adheres to the bran under the various systems of grinding and dressing. We have the opinions of millers on all these topics; but in the solution of questions in physical science opinions go for nothing, however closely they may approximate the truth. In other words, experimental, or as it is otherwise termed "established science" in the mill, has been allowed to fall behind. Now, millers cannot afford to wait until our slow-going philosophers beat up alongside; the scientific question involved being evidently a national one, that demands an experimental solution at the expense of the public; consequently, we propose advocating the cause of progress so far as determined physical data will permit, applying the goad as we go along to professional men of all grades with an impartial hand.

As to the old stive-room of the last century, the practice, or more correctly speaking, the means of carrying it out, was rather defective in special mechanism than defective in principle; as in the parallel case of the fanners when first introduced from Holland. So when pneumatic apparatus was applied in blowing flour and stive into the cooling-room, or stive into the stive-room, only the principle of filtering out the surplus air in either case was sound; and so was the practice according to the state of mechanical progress at the time, generally speaking. The old unpatented proposition of the miller, therefore, was sound in principle; but his details in special mechanism for carrying out his proposition into practice were defective, and consequently subject to future improvement.

The shortcomings of the miller's pneumatic project were many, the chief of which was his own greed for money, *i. e.*, laying more upon the back of the nether-millstone than it was well able to bear under the peculiar circumstances of the case, so to speak. In other words, as the exhausting apparatus relieved the millstone case and the grinding surfaces, the miller increased the feed, so as to do more work, thereby increasing the temperature, steam, and stive blown into the stive-room. The withdrawing of the heated air and floating steam from the atmosphere of the mill in the flour departments somewhat lowered its temperature, and also the temperature of the milleye shute, and spouting for conveying the flour to the cooling-room, where hopper-boys were in use, &c. The natural consequence of this would be the condensation of the steam and the pasting of the shute, &c.—results which were experienced in all cases where such premises existed. In other examples, where, with an exhaust, accompanied in some cases also with a blast, or influent current of air along with the grain, the millstones were not called upon to do more work than formerly, a practice which was carried out prior to any of our modern patents, the temperature of the grinding surfaces and flour was reduced, so that steam and pasting were well nigh if not wholly obviated.

Although nothing has been done to determine, in accordance with the requirements of modern experimental science, the physical data involved in either of the above two examples, yet the facts of the case are nevertheless indicated with sufficient clearness to be understood in a general sense in both of them.

In the former of these examples, the first sacrifice of mechanical principle is the performance of extra work with a given area of grinding surface. In grinding with the quern, the flour must have been slightly elevated in temperature, as compared with the temperature of the wheat or other grain ground, but not to a degree sufficiently high to produce any perceptible amount of steam, if any at all. And the same is true of the small hand-mills in use at the present day. But, in either case, it must be borne in mind that we reason from analogy, and not from the determined data of experimental or established science; for no reliable experiments have yet been made, so far as we are aware, to ascertain what is the increase of temperature, and whether any steam was, under the old practice, given off in grinding with the quern, or is given off in grinding with burr-stone hand-mills, or to what extent extra work done produces an increase of steam, and so forth. The common rule that heat increases with the square of the velocity does not apply, as will subsequently be shewn. But whatever may be the results of future experiment, one thing is certain—that to produce extra steam from extra work done, when such a result could be avoided by less work done, is a sacrifice of principle; and the true course of obviating the pasting in the mill case, milleye shute, conveyance tubing, and stive room or cooling room, where "hopper boys," or other contrivances for the same purpose are used, is not to produce the steam in the grinding. Our milling readers will doubtless perceive that this is an old practical conclusion, based upon a well-known familiar medical maxim, "prevention is better than cure;" for when steam is obviated by cool grinding, the flour retains not only its natural degree of sap or moistness, but also its aromatic and more volatile and valuable properties; whereas the generation of steam produces the contrary and something worse—not only waste of flour from pasting, but light flour of an inferior quality.

The sacrifice or loss sustained under the old practice in question is thus threefold—*first*, the waste of flour carried off by steam, forming paste; *second*, the reduction of weight from the natural sap of the flour being converted into steam; and *third*, the loss of aromatic properties, or, as it is termed in a patent of 1855, "Deperdition of aromatic and other matter"—a patent one of whose special claims is to obviate the loss of such matter, such being the losses sustained under the old practice of exhausting the millstone case, and blowing the flour into the cooling or stive-room, or both, or where the warm flour is bolted direct from the stones. The improvement sought is to obviate such losses; and the true course, or practical rule of action is grinding at a sufficiently low temperature not to produce steam, and the deperdition of aromatic properties. Any departure from this rule is a sacrifice of principle, which no commercial consideration can justify. By removing the cause you remove the effect; or rather the effect ceases to exist, and the economy sought in the manufacture of the article is realized.

From a commercial point of view some intelligent miller will no doubt reply to the above doctrine, "There is nothing new in all this." Millers have long tried to serve their customers by cool grinding; but the multiplication of the former, and the demands of the market, have placed the latter beside the practical question. That the multiplication of millstones ought to keep pace with the multiplication of mouths may be sound in theory, and in strict conformity with the practice of milling in the olden time, when fair maids

> "Warbled as they ground their parchèd corn."

But in modern times it, somehow or other, falls short of meeting the peculiar commercial demands upon millers. The days of impossibilities no doubt are gone by, and therefore the old rule may at some future period come into use again; but before it does so, many improvements have to be made in the mill.

This reply we shall dispose of in our next paper, along with the other propositions under consideration. ENGINEER.

THE CHAMBER OF AGRICULTURE.

A meeting of the Council of the Chamber of Agriculture was held on Tuesday, April 2, at the Salisbury Hotel, to consider the rating, valuing, and assessing of property, especially of woods, games, and metallic mines, and also the provisions of Mr. Hunt's "Valuation of Property Bill." The chair was taken at half-past eleven by the president of the chamber, Mr. ALBERT PELL. The attendance from the local Chambers included Mr. T. Chanler, Mr. J. Smyth, Mr. C. S. Read, M.P., Mr. W. Biddell, Mr. Jeremiah Birditt, Mr. R. Jasper More, M.P., Mr. Stanley Leighton, Mr. T. Horley, jun., Mr. Wm. Brewster, Mr. Edwd. R. Fisher, Mr. R. H. Masfen, Mr. T. Neville, Mr. F. Maitland Wilson, Mr. C. Rea, Mr. J. Paine, Mr. J. Jancey, Mr. E. Riley, Rev. E. Smythies, Mr. W. Gardner, Mr. Matthew B. Hicks, Mr. J. B. Lythall, Mr. John Ford, Mr. T. Duckham, Mr. J. Banks Stanhope, M.P., Mr. W. B. Beach, M.P., Mr. Corrance, M.P., Mr. J. R. Evans, Mr. C. P. Darke, Mr. James Howard, Mr. C. Wren Hoskyns.

The CHAIRMAN in opening the proceedings stated that the business committee, which met just before, had taken a room at No. 11, Waterloo Place, and had decided on printing the proceedings of the council meetings, and forward a copy of them to all the members of the Central Chamber, and to the Associated Chambers. There were now 148 members of the Central Chamber, and 188 local chambers associated with it, giving them an income of something like £230 a year—a sum which very nearly approached the income of the Associated Chambers of Commerce, amounting, he believed, at the present time to £284.

Mr. CORRANCE, M.P., wished to know whether as a member of an associated chamber he might be allowed to attend the Council meeting.

The CHAIRMAN replied that it had been decided that any member of Parliament who happened to be present and wished to take part in a discussion should be allowed to do so; but he could not vote unless he were a member of the Council or deputed to represent a local association.

The CHAIRMAN said they would now proceed at once to the business of the day, viz.: "The rating, valuing, and assessing of property, especially of woods, game, and metallic mines, and also the provisions of Mr. Hunt's Valuation of Property Bill." That bill had been considered by various local chambers, and he would state the result of their deliberations: The Herefordshire Chamber of Agriculture had passed the following resolution: "That incomes from real and personal property should be rated to the relief of the poor. That definite and general instructions, as a guide for rating, should be published under authority. That a rating officer should be appointed by the board of guardians, to act in concert with the assessment committee in each union. That the rent actually paid shall not of necessity be taken into consideration in the rating of property. That this Chamber feels that the appointment of a Valuation Board, and a barrister as an assessor, would be attended with an unnecessary expense, and fail in obtaining a uniform rate throughout the kingdom, and that Mr. Hunt's Bill, in other respects, is highly unsatisfactory." The Leicestershire Chamber had resolved as follows: "1. That exemptions from rating in favour of woods, plantations, and metallic mines, be removed. 2. That, having carefully considered the rating of game, this Chamber is of opinion that however desirable such a step might be in some districts, it is not possible to do so in justice to either landlords or tenants: at the same time, this Chamber is of opinion that no land ought to be rated at any less sum per acre on account of being stocked with game, in lieu of cattle. 3. That this Chamber oppose the principle of Mr. Hunt's Valuation of Property Bill. 4. That, as there are several clauses in the Bill which this Chamber does not approve of (especially clauses 55, 58, and 62), the select committee of the House of Commons be requested to hear evidence on the subject. 5. That this Chamber is of opinion that provision should be made in the Bill, and all the charges connected with relief of the poor, and over which the poor-law guardians have no control, should be borne by the nation at large. 6. That Colonel Halford and E. K. Fisher, Esq., be deputed to attend the meeting of the Central Chamber on the 2nd of April, to support the above resolution." The Loughborough Chamber had agreed to the following: "That whereas, in respect to Mr. Hunt's Bill, the payers of rates have too little voice in the county expenditure, and that nothing will be satisfactory in future legislation that does not give the ratepayers more power in the outlay of their money, that the Assessment Committee are the proper parties to fix the rateable value of property." The Norfolk Chamber had resolved: "That this Chamber recommend that all coverts and plantations be assessed to parochial and other national burdens at the same ratio as land of a similar quality thereto. That it is desirable that all land on which game exists should be assessed at the same ratio as land of the same quality where game does not exist." The North of England Chamber, comprising 1,000 members, had communicated the following opinion: "The Bills now before Parliament to assess the mines, woodlands, and plantations to local rates, and to provide for a common basis of value for Government and local taxation (the Valuation of Property Bill), having been taken into consideration, it was resolved that the Chamber support those Bills, subject to the following modifications—As to the Bill to assess mines, &c., that it ought to include game, fisheries, and ships; and that with respect to the Valuation of Property Bill—That the whole of the remuneration of the assessor mentioned in Section 28 should be paid by the Treasurer and not the half. 2. That Sections 55 and 62 should be struck out." The Newbury Farmers' Club had sent the following:—"After an animated discussion at the Newbury Farmers' Club, on the 29th of March, the following resolutions were carried:—"That farms on which game is reserved should be rated at their full agricultural value to the tenant. (This was carried by a majority of one only). That soil on which plantations of timber grow, should be rated at its annual agricultural value (carried unanimously). That minerals should be rated (carried unanimously). Mr. Hunt's Bill for the valuation of property unanimously opposed in its original form." The Penrith Farmers' Club had passed the following:—"That in the opinion of this Club, game, woodland, and metallic mines, should be rated, for relief of the poor and for repair of the roads." The Staffordshire Chamber of Agriculture had passed the following resolutions:—"That it is desirable the Central Chamber of Agriculture and of Parliament should be called to the injustice of levying so large a portion of the expenditure of the country out of local taxation—that taxation falling exclusively on a limited class of property, and that in their opinion the assessment for these purposes should be extended as far as possible to other properties." The Wakefield and West Riding Farmers' Club had resolved on the 29th of March, "That it is the opinion of this meeting that woods and mines should be rated according to the average interest derived from them, and that game, wherever producing rent or profit, should become chargeable, and that all property from which a beneficial interest is derived, and which is now exempt under 3 & 4 Vic., especially should be rated in the same way as coal mines and other rateable property. That this meeting approve of Mr. Hunt's Bill as to the principle of uniformity of rating property, but does not approve of the organization by which it is to be carried out." The Warwickshire Chamber of Agriculture had passed the following: "That in the opinion of this Chamber the proposed object of the Valuation Act, 1867, to produce conformity of rating, can only be obtained by the maximum scale of deductions being fixed by Act of Parliament, for the whole country, instead of being left to the discretion of a Valuation Board for each county as proposed in the Bill; and, provided a short Bill be passed embodying the 5th section of this Bill as to gross estimated value, and fixing the maximum scale of deductions to find the rateable value, there is no need of the complicated and expensive working of the present Bill." Having read those opinions of some of the chambers, he wished to say one or two words as to his own view of Mr. Hunt's Bill. Mr. Hunt appeared to him to be attempting to reconcile two irreconcilable parties, the owners of real property and the surveyor of taxes. There was an apparent contradiction in the bill. If they looked at the definition of the term "gross value" in the early part of it, they would find that it was the annual rent which a tenant might reasonably be expected to pay for the farm, taking one year with another; and yet, if they turned to section 55, they would find it stated that the gross annual value was never to be less than the rent paid within the year. In the early part of the bill they saw the hand of Mr. Hunt, representing the landowner; in the latter part they saw the public assessor, who finding that the tax of fourpence in the pound was easily collected under the present system, was not willing to abandon that system. Whether the two departments of the State—that which dealt with local and that which dealt with national taxation—could be reconciled on that point remained to be seen.

Mr. C. S. **Read**, M.P., said he should like to propose the following resolution: "That a petition be presented in favour of the general principles of Mr. Hunt's Valuation Bill, and especially that clause which favours direct representation." This resolution was, he might remark, similar to one which was passed by the Norfolk Chamber of Agriculture last Saturday. Mr. Hunt's bill was very unpopular in that county, because if passed it would undo a great deal that was very well done by the Union Assessment Committees, who had worked in a practical and business-like manner. As regarded the rating of parishes as between themselves, he thought he might say pretty confidently that, taking one with another, they were fairly assessed; but when they came to compare Union with Union they would generally find, not only that the deductions were very various, but also that the principle on which the gross estimated rent was obtained equally varied. It was proposed by Mr. Hunt's bill that there should be a Board to determine the value of deductions to be made from the gross estimated rental in order to arrive at the rateable value. That was, no doubt, right in principle; but, then, like the Chairman, he did not concur in the principle of introducing the assessor of taxes in the assessment committee; neither did he like the 55th clause, which said that the rent should be taken only as the minimum. That supposed that there was only one class of landlords, namely, generous landlords (Hear, hear); whereas they knew that there were many landlords who screwed down their tenants to the lowest point that was practicable (Hear, hear), and in such cases it would be hard to assess the occupier to the extent of his rent (Hear, hear). The representation of the ratepayers was a principle which ought to meet with unanimous support, but perhaps some of those who were supposed to be so much in favour of direct representation would be found to be the very persons who were most opposed to it. He would take that opportunity of stating that he intended to propose the insertion, in Mr. Percy Wyndham's bill for the rating of woods and mines, of a clause to the effect that in all cases in which game superabounded upon any land so as to decrease its agricultural value, such land should nevertheless be rated at the full value; and, further, that when the value of any land was increased in consequence of the existence of game thereon, such land should be rated at the increased value.

In reply to a question from Mr. **Jasper More**, M.P.,

Mr. **Read** observed, in explanation, that supposing land to be worth 1s. 6d. as a sheep walk and 1s. for game, he would value it at half-a-crown.

Mr. **Masfen** wished to know how Mr. Read would deal with the case of one estate of 500 or 1,000 acres, being worth only 25s. an acre, in consequence of game being preserved, when but for that circumstance the rack rental would be £2 per acre. How did he propose to make up the deficiency of 15s.?

Mr. **Read** said if land were stocked with game so as to decrease its agricultural value as regarded all local rates he would have it assessed at its full rateable value.

Mr. **Corrance**, M.P., observed that besides "woods, game, and metallic metals," there was other property of still greater value now exempted which ought to come under some sort of rating, and in support of this view he cited the authority of Mr. C. P. Villiers, late President of the Poor Law Board, and Mr. Lumley. If he were asked to specify this exempted property, he must begin with one the mention of which would be sure to raise a grave question—he referred to the public funds. Then there were shipping, mortgages and a vast number of items, all being personal property, stock in trade not excepted. No doubt gentlemen winced a little when he said stock in trade, and would at once assume that it applied to farming stock. But it did not, for farming stock was already assessed under Act of Parliament. With regard to the public funds he cited cases from Chitty's "Burn's Justice of the Peace," to show that they had not always been exempted from assessment. Coming, then, to Mr. Hunt's Valuation of Property Bill, the hon. member said that that measure contained some important and valuable provisions, whatever might be said of it as a whole. For example, he entirely approved of the establishment of mixed county assessment boards; also of the minimum of rent being taken as the minimum value for assessment. It had been said that that would press upon the occupier, but he could not see how, for in all cases it must be a matter for the landlord to pay. If they did not know this basis that was to be taken, they might be unjustly assessed; but when they knew that the rate was the minimum that could be charged, it rested with themselves to assess the amount. In all cases it was a landlord's charge, and when the minimum was taken as the standard from which to proceed upwards, then only would they be on good ground. Another provision which he approved of was that in all cases the gross rental should be taken as the minimum of charge. It had been objected to the mixed boards that ratepayers and owners were not often of one mind on the subject of assessment, and that they would not meet on equal terms in council. He could not, however, see the force of this objection; for the valuation board would not spend money, consequently there was no danger of the occupier's interest, which was a temporary one, militating against the united action of the board. As to the assessment of game, it appeared to him that that was a question full of difficulty, though he saw no objection to adopting the Scotch system of assessing game wherever it bore a rent.

The Rev. E. **Smythies** (Loughborough), in seconding the motion of Mr. Read, remarked that that gentleman had spoken of a "superabundance of game," and that was a phrase which seemed difficult to define.

Mr. **Darke** (Newbury) said he had been deputed by the Newbury Farmers' Club to oppose Mr. Hunt's bill on these grounds: That there was a new element to be introduced into the constitution of the Valuation Boards. That, although the difficulties of the valuation were so great that the existing assessment committees had hardly been able to surmount them; yet the new boards, which, with the exception of one individual upon them, would comprise the same materials as the old committees, were evidently meant to be a court of appeal. That it would not be possible for them to arrive at any conclusions contrary to the principle which they had already introduced into their valuations. And, above all, he opposed the bill specially on the ground of the fifty-fifth clause. That clause stated: "In calculating the gross value for the purposes of this Act, the annual rent which a tenant shall reasonably be expected to pay shall not be less than the rent actually paid." If that clause were susceptible of any interpretation at all, it was, that no valuation should be legal that did not actually amount to the rent at which the property was let. It did not refer to a depreciated rental; and in the opinion of himself and those who acted with him, there was no more vague or unsatisfactory principle than that of rental—none more precarious or irregular. Indeed, it was upon that ground that the valuations had been so unsatisfactory hitherto. If they would value a parish as it ought to be valued, they should call in some person who would take a professional view of the matter, and give a fair and reasonable agricultural value for both lands and houses. His objections on this head were so strong that he should wish to see the fifty-fifth clause expunged from the bill. The first duty of the new Board would be to decide on the deductions from the gross rental; and if the men who were now employed by the assessment committees could not arrive at a decision on this point, what reason was there to suppose they could do so when assembled in another room? He was confident that it would be a failure, just as it had hitherto been with the assessment committees. They would not arrive at anything like a fair value of the amount of the deductions. There was at present a case before the Court of Queen's Bench in which certain clergy who objected to the deductions were concerned. They said there were two distinct interests included in repairs—one the tenant's interest, and the other that of the landlord; one embracing the materials for the work, and the other embracing the workmanship; and because the tenant had agreed to undertake the workmanship, therefore it was not a fair principle of deduction. That was the ground on which the case was being contested. On the whole, he was of opinion that the Board proposed would be a failure; in short, he objected to the whole principle of the bill, as being wrong from first to last, and would meet the resolution of Mr. Read with a negative.

Mr. J. R. EVANS (also of Newbury) supported his colleague's view of the case.

Col. HALFORD (Leicestershire) saw great good in Mr. Hunt's Bill. The use of the valuation board would be to bring the gentlemen together, in order to arrange a regular scale of deductions for the whole county, instead of each Union having its own special scale. Once that was done, the greatest good would arise, the assessment would be made in a fair and equal manner, and there would be no trouble whatever about it.

Mr. BIDDELL (Suffolk) presumed it was the object of the Bill to get a uniformity of assessment over all the counties, instead of one board adopting one rate of deductions, and another board another rate in the same county. Hitherto the different principles adopted on the part of different boards had produced anything but an niform system comparing Union with Union. True, they had been successful in producing uniformity within the Union; but the object of the Bill was to make the Unions uniform with one another. He did not, therefore, see that any person could reasonably object to the principle of the Bill. To some of its details he himself objected; but that its object was good he could not for a moment doubt. His chief objection was to the 55th clause, which he regarded as utterly bad without a single redeeming feature. Anyone who knew what rents were, and how much they varied, must come to the conclusion that if the assessment varied with the rent, they would have rates nothing like so uniform as they were now. Why, sometimes rents had no relation whatever to the value of the land. A man anxiously desirous of getting possession of a particular farm would take it without exercising any judgment whatever. He had a case in point in his own neighbourhood, where a very fine farm in a beautiful situation was to be let. Man after man came to the Marquis of ——, and told him if he would let them the farm the amount of rent was no consideration at all. They did not care about the rent; they wanted the place, not to get a living out of it, but to spend a living upon it. If the Marquis had accepted snch an offer, he might have had, say 50s. an acre for it, whilst the adjoining farm was fairly rented at 30s. an acre. But was it fair that the lower-rented farm should be rated the same as the higher-rented farm? Under the 55th clause, however, there was nothing to prevent the farm let at 30s. an acre from being assessed at the same rate as the farm let at 50s. an acre. Thus the operation of the clause would be to rate the farm up to the highest point.

Mr. DARKE: That was the very object of the bill.

Mr. BIDDELL could not agree to that; but the introduction of this clause was undoubtedly a mistake, and of the bill, as a whole, he generally approved, though if it were adopted in its present shape he feared that every farm would be assessed upon too high a scale. He hoped, therefore, the Chamber would pass a resolution condemnatory of this clause, and do its utmost to get the clause expunged from the bill; for instead of working to secure a uniformity of rating, he believed it would operate to produce the greatest possible disparity. There was one thing in the measure of which he warmly approved, and that was the provision which directed the central board to issue schedules of instruction as the basis on which the rate was to be made. That was a very good idea, but the success of the bill would very much depend upon what these instructions were.

Mr. JANCEY (Herefordshire) perfectly agreed with Mr. Biddell that it was desirable to have a uniform system of rating throughout the country, but did not think the central board proposed to be established would give that uniform system. At present different modes of deduction and rating existed in the unions. By the bill the difference would be between the counties. It would be better, therefore, if some principle of deduction and rating of general application were laid down, and that it should not be fixed by the different counties; for in that case it would only be getting out of the unevenness in the unions and establishing it in the counties. He did not say that the present system was the best that could be adopted. It was almost impossible that a rating committee could fairly determine the appeals that were brought before them from different parts of a union, and he thought it necessary that they should have some aid from a rating officer, but he could not regard the surveyor of taxes as a man who was likely to be of any use to them. It would be the object of the surveyor to raise everything to the highest point, and as soon as a rate had been sent in by any parish, he would, without knowing anything of the value of the property, make everybody pay or appeal. That would hardly be of much assistance to the assessment committees; whereas, if they had the power of appointing an officer on certain terms, whom they could call upon to see the various properties and report upon them, that would be of very great service. With respect to Clause 55, if that were retained as part of the measure the result must be a most unequal and unjust rating. The system had been adopted in a union in his neighbourhood, and had created general dissatisfaction; and he felt that there could be no system more unequal and unjust than that of taking the rent as the value. To make it equal they must take the highest rent and raise everything else up to it before they could have an equal rating. If it were necessary to have a valuation board for every county, to fix the deductions, why not appoint two or three gentlemen from each assessment committee to meet together to fix the deductions, without having recourse to a barrister, a surveyor, a treasurer, clerk, and such expensive officers?

Mr. DUCKHAM (Herefordshire) had great pleasure in endorsing the opinions expressed by Mr. Jancy. He held in his hand the instructions which had been published by the authority of the Government for the guidance of the valuers and surveyors in Ireland, and those instructions were so clear and good that he had hoped whenever the time came for altering the system of valuing land and houses in England, the principle of these instructions would have been carried out, instead of adopting the round-about and expensive method of valuations, boards with their staffs of clerks, treasurer, and so forth. The instructions to the Irish valuators lay down as a first object the obtaining a uniform system of rating. If county boards were formed, one principle of deduction would be adopted in one county, and perhaps the opposite principle in another, and that the adjoining one: the result would be under Mr. Hunt's bill that a different amount of income-tax would be paid on similar land. Whatever principle was adopted then, he held that it should be for the whole kingdom. If it could be carried out satisfactorily in Ireland why not also in England? In Ireland, all mines, plantations, woods, fisheries, &c., were taken into consideration and valued at their fair agricultural value; and as the instructions worked well in Ireland, why not adopt them here and make the system uniform in both parts of the kingdom? In these instructions the assessor was directed to take into his consideration the nature of the soil, the subsoil, the situation, the roads in the locality, the distance from the nearest market, whether the land sloped to the north or the south; all was laid down as clearly as possible. And if some general principle were laid down for the assessment committees in this country to act upon, there would be no need for valuation boards, with their clerks, treasurer and so forth.

The CHAIRMAN: There must be somebody to see that the instructions were carried out.

Mr. DUCKHAM would commit that duty to the assessment committees.

Mr. J. B. LYTHALL (Warwickshire) was opposed to Mr. Hunt's Bill on the ground set forth by Mr. Darke. The title of the measure was: "A Bill to provide for a common basis of value for the purposes of Government and local taxation, and to promote uniformity in the assessment of rateable property in England;" but no one who read its provisions could come to the conclusion that it would promote uniformity. No doubt it would promote uniformity in the assessment of rateable property in unions; but the assessment would be just as diverse in counties, as it was in unions now; whilst no measure would be satisfactory that did not provide for a uniform assessment throughout the whole country. The next objection to the bill was the constitution of the Valuation Board: that the county magistrates should be equal to the remaining members of the board. In his opinion the assessment committee who sent their members to the board should depute the best men, no matter whether they were magistrates, tenant-farmers, or any of the professions. He considered also that the maximum deduction should be fixed by Parliament, or they would be as far off from uniformity as before. They had been told by Mr. Corrance that the board would have had no power to spend money; but if any one after reading the bill came to the conclusion that the treasurer and clerk could carry on matters without spending money he was very much mistaken.

The Chairman: Mr. Hunt suggested that these offices might be united in one person.

Mr. Lythall also thought that undue power was given to the surveyor of taxes. Clause 43 provided that "Notice of any objection by any person other than the surveyor of taxes shall be given before the expiration of the same 17 days, provided that the surveyor of taxes may object at any time during the revision of the list by the assessment committee on giving 7 day's notice to the ratepayers affected thereby." He was at a loss to know why the surveyor should have greater power of appeal than any one else who felt aggrieved. But the same spirit ran throughout the entire bill. As to the 155th clause, he agreed with previous speakers in condemning it.

Mr. T. Horley, jun. (Leamington), admitted that the object of the bill was a desirable one, namely, the establishment of uniform rating throughout England and Wales; but he thought the measure would fail to accomplish it. No power was so fitted to lay down what should be the uniform basis for valuation as a Select Committee of the House of Commons. For his part he could not see why property of a similar description, whether it were situated in Northumberland or Hampshire, should not have the same deductions. Nothing of course could be done without incurring expense; but there was one officer whose services would be required under the bill, and who would be rather costly—he meant a first-rate accountant.

The Rev. E. Smythies approved of the general principles of the bill, but there were two or three clauses which were grievous blots in it, particularly that which prescribed the duties of the surveyor of taxes. Wherever he went and with whomsoever he talked, he found a universal agreement on that point. The surveyor was everywhere looked upon as a sort of Ishmael, whose hand was against every man and every man's hand against him (laughter). This might be prejudice to some extent, but there was no doubt that he had an interest in going on the principle of putting up the assessment as high as he could, and leaving the ratepayer to his own resources to bring it down to the just level. The clause to which he had referred provided that the surveyor should state what he considered should be the value to be put upon any property in the valuation list; and this was not to be the subject of appeal before the assessor unless the individual ratepayer could show that it was unjust. Upon what ground was it, he asked, that the surveyor of taxes was to be put in a different position from that of an ordinary ratepayer? Of course, it was only right to have an officer to defend the Government revenue; but that necessity could be amply provided for if he were regarded as in the position of an individual ratepayer, so that if he thought property was valued too low he should have the power of appealing to the assessor, the barrister of ten years' standing, who was to hold the court of appeal. That would meet every objection, and take away the invidious power which would operate against the interest of all persons concerned in the valuation list. With reference to the bill as a whole, its general principles were good, and what alterations were required might easily be made when it got into committee.

Mr. Masfen (Staffordshire) agreed that uniformity of rating was not only necessary but imperative, and suggested that the Chamber ought to come to some definite resolution, not so much condemnatory of the bill, as in the way of proposing an improvement upon it, or they would be taxed with having assembled to cavil and carp at a thing which, in truth, they had not brains to amend.

Mr. Stanley Leighton (Shropshire) was not prepared to vote against the principle of the bill, for, in his judgment, it was a good one; and the objectionable clauses might be amended in committee. As to the case mentioned by way of illustration, by Mr. Biddell, of a farm worth 30s. an acre being valued at 50s., the valuer who ventured to do that would certainly be doing what was decidedly wrong.

Mr. Fisher (Leicestershire) said the Chamber of Agriculture he represented had passed a resolution generally in favour of the principle of the bill, which was the attainment of a uniform assessment: at the same time, the feeling of the meeting which had deputed him to attend that day was strongly expressed against the clause introducing the surveyor of taxes, and the clause which insisted that the rent should be the minimum of the gross estimated rental. To these clauses also he himself was decidedly opposed, for he did not see how it was practicable to act upon them. They were a departure from the spirit of the instruction issued to the assessment committees, which was that the gross estimated rental should be that which would be a fair and reasonable rent, beyond which no instructions were required. To attain that, it would be necessary to have something like a full rent, else there would be so many standards of value, which would be an evil. What he would propose, then, by way of alteration, to make the bill work well, was that these two clauses should be omitted altogether. Next came the question how they were to insist upon the gross estimated rental being something like the full value. These clauses were no doubt inserted for the purpose of keeping up the standard of value; and he would propose, instead of them, to try if a more satisfactory and impartial court of appeal could not be obtained. There were no means of maintaining the standard of value except through an appeal. He then came back to the clause referring to appeals. One gentleman seemed to think that the board, which was to be elected for a certain purpose, was also to be a court of appeal; but this was not the case—it would be elected for the purpose of laying down rules for deductions. As to the appellant barrister, he would do away with that provision, because it would not be a satisfactory last appeal, which no appeal could be if it had to be made to one man alone. Therefore, he would propose, as the appeal to the Court of Quarter Sessions was done away with, that the county board should be the court of appeal. It would be much better than the Quarter Sessions, because it would comprise practical men who were now members of the assessment committees, and only half of them county magistrates. This county board might possibly be susceptible of improvement in some respects; but, in the main, it would be a satisfactory court of appeal, subject only to an appeal from its decisions to a higher court on points of law; and as the members of that court would reside in different parts of the county, there was no reason why they should not hold their appeals in different parts of the county. That would do away in a great degree with the question of expense; for the county board would not be an expensive body—in fact, their personal expenses only would have to be paid. He would, therefore, take Mr. Hunt's bill mainly as it stood, expunge the two clauses to which he had referred, and alter the mode of appeal.

The Chairman, in putting the question that the Chamber do disapprove of the Bill, remarked that the present discussion showed there was a distinct objection to that portion of the measure which was intended to provide a basis of valuation for the purposes of the Government, whilst there was not so much objection raised to that which dealt with local taxation. But there was a difficulty in the minds of gentlemen in reconciling the two objects which Mr. Hunt attempted to reconcile by his Bill. The fact was, Mr. Hunt seemed to have one eye on Somerset House and the other on Whitehall; and, as a consequence, they had a sort of "squinting bill," so to speak, which was exceedingly puzzling. That was the difficulty. Somerset House was unwilling to accept anything short of the full rent paid for the income-tax, whether the principle was right or wrong; and the county people were equally unwilling to see property assessed on the basis of rent, when they knew that the man who paid income-tax upon that rent was only doing harm to himself and family. He suggested that the Chamber should recommend the omission of so much of the Bill as laid down a basis of assessment for the purposes of the Government; but before doing that he would put the question that the Chamber do not approve of the principle of the Bill.

The question being put was lost by a large majority, three being only five hands raised in its favour.

Mr. W. Brewster (Shropshire) next moved as an amendment to Mr. Read's motion, "That this Chamber is of opinion that uniformity of assessment throughout England will be best attained by the legislature drawing up instructions for determining the rateable value, and that the existing boards of guardians are sufficient to carry out such instructions, provided power be given to them to appoint a rating officer for the union."

The Chairman: For the union, not the county?

Mr. Brewster: Yes.

This amendment, on being put to the vote, was also negatived.

Mr. Jancey then proposed, and Mr. Duckham seconded, a third amendment, "That real and personal property shall be rated to the relief of the poor; that definite and general instructions as a guide for rating shall be published under authority; that a rating officer shall be appointed by the board of guardians, to act in concert with the assessment committee in each union; that the rent actually paid shall not of necessity be taken into consideration in the rating of property."

Mr. Bankes Stanhope, M.P., was of opinion that if the surveyor of taxes were struck out of the Bill, there would be an end of the measure. The most practical remarks that had been made that day were those of Mr. Fisher from the Leicester Chamber of Agriculture; and for the purpose of facilitating business he would advise that they should take the clauses of the Bill into their consideration, and specify those to which they particularly objected; suggest any other machinery that seemed preferable to what was contained in the Bill, and appoint certain persons who were most conversant with the subject and shared in the views of the Chamber, to appear as witnesses before the Select Committee on the Bill.

Mr. Darke observed that one of the principal grounds of objection on the part of the Newbury Farmers' Club to the bill was that it prostituted the returns made under schedule A and B of the Property and Income Tax Act, which were of an entirely private nature. He contended that neither the public nor any committee had a right to possess themselves of returns with respect to the terms of what was a private contract between landlords and their tenants. What had the late Government done? They had positively handed over these returns without the consent of the parties to the Assessment Committees.

The Chairman agreed with Mr. Bankes Stanhope that if they took out the interference of the surveyor of taxes there was an end to the bill.

The amendment of Mr. Jancey was likewise negatived.

Colonel Halford proposed as an amendment "That this chamber approves of the principle of Mr. Hunt's Valuation of Property Bill; but as there are several clauses, especially the 55th, 58th, and 62nd, which it does not approve of—Resolved: That the Select Committee of the House of Commons be requested to hear evidence on the subject."

Mr. Beach, M.P. (Hampshire), believed that, so far as the principle of the bill was concerned—that was uniformity of rating—there was but one opinion. The Parochial Assessment Act provided no machinery for attaining that object, and there was no doubt that a considerable difference existed between various unions. No definite instructions had emanated from any central authority; consequently each union had been left to exercise its own descretion. Even supposing that a person were appointed by the union as a rating officer, they would still be left where they were now, without a central authority to control them. One defect in the Parochial Assessment Act imperatively demanded a remedy: it provided no efficient court of appeal. The appeal was to the quarter sessions, and that was not a proper court to decide on appeals from different unions in different parts of the country. In committee on that measure he had moved a clause to restrain any justice of the peace from sitting on an appeal against which he himself had assisted in arriving at; and Mr. Hunt's bill recognised this defect and tried to provide a remedy. He did not mean to say that it did this in an efficient manner. He did not much approve of the revising barrister, who could not be very well acquainted with the local circumstances of every case. But what was a serious defect in the bill was the clause relating to rent. No doubt when the Assessment Committees had to take into consideration what was the fair and reasonable value of land they endeavoured to arrive at it in the best way they could. They took the income tax returns under schedule A, the returns to the county rate, and in some cases they also took the rent; and between these they struck a mean value which they considered a fair one; but under the Parochial Assessment Act rent was never introduced, and it was at the option of the Assessment Committees to take it or not, as they liked. At any rate he trusted that this clause would be withdrawn from the bill.

Mr. T. Horley, jun., having seconded the amendment of Col. Halford, it was put to the meeting, and carried *nemine contradicente*. The original motion was consequently lost.

The following gentlemen were then nominated to give evidence on behalf of the Chamber before the select committee on the Valuation of Property Bill: Mr. Fisher (Leicestershire), Mr. Lythall (Warwickshire), Mr. Biddell (Suffolk), Mr. Duckham (Herefordshire), and Mr. T. Horley, jun. (Leamington).

Mr. Masfen said he was exceedingly anxious to see an Act passed for the rating, valuing, and assessment of woods, game, and metallic mines.

Mr. B. Stanhope, M.P., did not believe that the House of Commons would be able to decide such a question as that without taking evidence. He would suggest, therefore, that the Chamber should come to a resolution that, whilst it was of opinion that woods, mines, &c., should be rated, the subject was one of such importance and involved so many difficulties that it was desirable to appoint a select committee of the House of Commons to take evidence and report thereon in the first instance before any attempt was made at legislation.

Mr. T. Neville (Staffordshire) moved: "That in the opinion of this Chamber the assessment for local taxation should be extended as far as possible to all property, and that a petition be presented to the House of Commons in favour of the appointment of a select committee to take evidence on the subject."

Mr. B. Stanhope, M.P., said there was a bill before the House of Commons at that moment, waiting for second reading, which included mines and woods.

Mr. Jasper More, M.P.: But not game.

Mr. Neville, speaking in support of his resolution, said he had proposed it on general terms, on the ground that local taxation had increased so enormously of late years, whilst the landed interest had ceased to enjoy the privileges and immunities they formerly possessed under the system of protection. At one time they were exempt from the succession duty to which they were now subjected; and he saw no reason why landed property and the few other properties that were assessed to local rates should bear those burdens alone. He held in his hand a return made to the House of Commons in 1865 of the different incomes upon which the tax was charged. These comprised twelve different heads, and of these twelve only four were assessed to local taxation. The gross amount of the return was £330,000,000, and of that amount the local burdens were charged on the four heads to the extent of £160,000,000. The other heads of income, including public dividends, hereditary pensions, public companies, trades and professions, offices, salaries, superannuations, mines, ironworks, &c., were of the annual value of £170,000,000, and were exempted from local taxation. Consequently, not one-half of the actual income of the country was charged to the local burdens of the country.

Mr. Rea (Northumberland): These figures showed most indisputably that other property besides land and real property ought to be valued and rated. These exemptions had continued by far too long, and the fact was that some of the property so exempt had been a prolific source of pauperism in certain districts. In his part of the country there were vast mines of coal, iron, and lead, from which enormous returns were derived; but coals alone bore any share of the local taxation—the iron and lead were exempt. When a slack time came in the iron and lead trade, and large numbers of persons were thrown out of employment, their support was cast entirely on the land in the several townships where the people belonged, and their masters who had been gaining immense incomes, so long as trade was good, contributed nothing towards the cost. He had great pleasure therefore in seconding the motion of Mr. Neville.

Mr. Biddell moved, as an amendment, "That this Chamber is of opinion that land should be rated in proportion to its natural fertility, whether stocked by game, sheep, or other animals, or covered by wood or (artificial) water"; but there being no seconder, the amendment was withdrawn.

Mr. Matthew B. Hick (Wakefield) observed that as the resolution proposed by Mr. Neville embraced every description of property, he should give it his support, not that he thought, however, that crown property should be made liable to local taxation. Still, it was a subject which required to be ventilated and considered, and no doubt would receive the attention of Government or of a Select Committee of the House of Commons.

Mr. Fisher approved of coming to a general resolution in preference to one that entered into details. With regard to woods, he divided them into two classes—woodlands and plantions of an ornamental character. As to the latter they were not now rateable, unless as saleable underwoods, and in connection with the residence. When a value was put on the residence, that value was considered with reference to the ornamental character of the place, and the advantages it derived from plantations, water, and other things. So that if they came to rate the plantations immediately around a mansion, and put the mansion at the same price too, they would rate the plantations twice over. Supposing, however, that the mansion was rated with its ornamental plantations, gardens, &c., and they arrived at a fair basis of value on that, then, if the owner chose to withdraw land that was rateable and plant it ornamentally to suit his own taste, such ornamental plantations ought to pay rates the same as the adjoining lands. Woodlands stood in a different position, the landlord coming into possession of them as he did his other property.

Mr. Darke : Underwoods were already rated.

Mr. Fisher held, in opposition to the view implied in Mr. Biddell's amendment, that they had no right to set up a value with regard to woods on account of the value of the land adjoining; but he would assess all property in which a beneficial occupation could be shown. It would be fair, therefore, to rate timber, in addition to the saleable underwood, and there would be no great difficulty in fixing the gross estimated rental of timber much in the same way as was now done with underwoods, by taking certain growths and certain averages. But, in bringing woods within the category of rateable property, they must be assessed as woods. With reference to game, he was not then prepared to go into that; but passing on to the subject of mines, coal mines were liable under a special Act of Parliament to be rated, whilst iron and lead were exempt. In his opinion every sort of mine ought to be rateable. The existing principle of rating, however, was not a fair one. It was an unfair thing to rate a mine according to the royalty which was paid to the owner. The gross value of the minerals extracted from the mine should be capitalised, and the rate made upon the interest of the capital. A great many inconsistencies and hardships were connected with the rating of mines. Iron mines in Derbyshire, Staffordshire, and Wales, where the ore was extracted from the deep, were not rated at all; whereas in Northamptonshire and other places, where the ore was dug from the surface, they were rated on the royalty paid to the owner, which, in many cases, was as much as £300 an acre. The only ground for rating them in that way was taking the word "royalty" as an equivalent for rent, which was not correct. He concluded, then, that they would be justified in insisting upon all these properties being rated, but rated upon a just and fair principle.

Mr. Jasper More, M.P., observed that last spring the ironmasters met, and after fully discussing the subject, assented to the proposition that mines should be rated, although they had since slightly modified their views. As to rating woods and game, it was a mistake to discuss that; for if the object was to reduce the rating generally throughout the whole kingdom to one uniform level, there were twenty other different kinds of property that ought to be included. For example, one gentleman had made special reference to the public funds amongst the other descriptions of property; and if all were rated, mines, woods and game would be a mere drop in the bucket, and not worth speaking of in connection with the vast amount of other property that was not now rated. In discussing the question of rating woods and mines, they dealt with two species of property which of all others it was most difficult to set a value upon, whilst there were twenty others on which the value could be assessed without the least difficulty, and these were left out of the consideration altogether by such a proposal as that of Mr. Biddell.

Col. Halford owned to being greatly astonished at hearing the term "property" applied to game. He was not aware that it was property, and as soon as it became property it would be felony to steal it.

Mr. Darke : Was there not a joint occupation in the land in the exercise of the right of sporting? They would not rate the game, but the annual value. Taking it as a joint occupation, the difficulty was at once got over, and they had something that was tangible. It would not interfere with game farms, the assessment of which, according to the present law, was to be regulated by their full agricultural value.

Mr. W. Brewster did not agree with Mr. Jasper More that woods were of little value. Some four or five years ago, being at the time a member of the Board of Guardians of Penkridge Union, in Staffordshire, he introduced this matter to the notice of the Board, and asked for a return from the different overseers of the acreage and rateable value of the woods, plantations, waters, &c., in that Union, which was a very small one. The result was, that it appeared that there were not less than 3,481 acres of woods and water, the rateable value of which was 5s. 1d. per acre. In many Unions in Shropshire, where he now lived, he had no doubt the woods were more extensive even than in the Penkridge Union. True, game was not property; at the same time, if the landlord stocked the land with game, and reserved it for his own use, it was not reasonable to expect the tenant to pay the same rent as if it were without game altogether, or stocked with only a moderate quantity.

Mr. Jeremiah Birditt moved an addition to the resolution, to thee ffect that a Select Committee of the House of Commons should be requested to take evidence "specially with respect to the rating, valuing, and assessing of woods, game, and metallic mines;" and Mr. Brewster seconded the amendment.

Mr. Neville said he could not assent to the proposal, and would prefer withdrawing his resolution to accepting it with such an addition. His own opinion was, that all realized income ought to bear a share of the local taxation, and that was the basis of his resolution.

The amendment was then put and negatived, and the original motion carried unanimously.

A vote of thanks having passed to the Chairman, that gentleman announced that the next subject which would be taken into consideration by the Chamber was the employment of women, young persons, and children in agriculture, in connection with the educational question. That would be taken in the month of June; after which there would be no further discussion until the autumn, when the malt tax would receive their attention. He added that a general meeting of the Chamber would be held at Bury St Edmund's during the Royal Agricultural Society's Show, in July.

The meeting then separated after a sitting of more than four hours.

THE HOUSE OF COMMONS.

TUESDAY, APRIL 2.

WOMEN AND CHILDREN EMPLOYED IN AGRICULTURE.

Mr. DENT, in calling attention to the sixth report of the Children's Employment Commission, said that the report contained facts of so grave a nature as to the bad results attending the indiscriminate employment of women and children that it became the duty of the House, as it had already been the duty of the press, to take cognizance of them. In 1843 the Assistant Commissioner appointed by the Poor-law Board touched upon the system of employing women and children in gangs in the agricultural districts. In 1862-3 the medical officers connected with the Privy Council in their report upon infant mortality again alluded to this system. It prevailed in Lincolnshire, Huntingdonshire, Cambridgeshire, Norfolk, Suffolk, and Notts. A gang-master contracted for the work of a farmer, and was a sort of middle-man, often perfectly unfit to undertake such a charge. Under him worked the gang, which consisted of from 10 or 12 to 100 women and children of both sexes. This system had been attributed to the existence of large properties and close parishes, on which the labourers were not allowed to live. But it was not entirely consequent upon this state of things, because in the Isle of Axholme, where the land was owned principally by small freeholders, women and children were employed "to a greater extent, perhaps, than any district in the county." The Commissioners estimated that 6,400 persons were employed in public gangs; but there were also private gangs, superintended by one of the farmer's own labourers. An analysis of returns from a number of parishes showed that 1,636 children were employed under the age of 13, of whom 871 were males and 765 females; that of young persons between 13 and 18 quoted there were 386 males and 536 females; and over 18 years there were 70 males and 388 women. Mr. White found 20 children employed under the age of seven, and they began work even as early as five or six. Boys and girls of this tender age went five or six miles to their work and the same distance back. In fact, a case was given in which two girls aged respectively 11 and 13 years had to walk eight miles each day to their work, so that they walked 16 miles each day, besides working from 8 a.m. to 5 or half-past 5 in the afternoon. In some districts the day's work averaged 8, in others 11 hours. Then, as to wages, in Suffolk the children began with no more than 2d. or 3d. a day; and of two children in a gang, the mother said, "Agnes was seven when she began, and got 2d. a day; Frank was six, and got 1½d.; he has been heightened ½d. each year since." It would be seen from the reports of medical men on the subject that the death rate among the children who were thus engaged in agricultural labour was very high, as well as among the infants of the adult females who were similarly employed. The medical officer of the Privy Council described these gangs as travelling several miles from their native villages, looking strong, but with the taint upon them of their customary immorality. It was not, he might add, only the loss of life in these cases which was to be deplored, but the hardened feeling which the operation of the system produced in the women themselves, making them completely reckless, and giving rise to a terrible brutality. The death of their children was made by them, it appeared, but too often a matter of speculation, a common expression among them when one of them gave birth to an infant being "You will see it will not live," the prophecy being made the subject of laughter. A more hardening system, in short, could not well be conceived, although it had not been very long in existence, for it was not more than 20 years ago that the Assistant Poor-law Commissioners had spoken of it as a very recent thing. It had its origin in the fact that large tracts of land had, by the ingenuity of our engineers and the energy of our farmers, been reclaimed from the sea, and rendered, from being a mere marsh, most productive. The consequences of the system were as yet scarcely felt in their full force, but if its hardening influence went on progressing, it could not fail to have a very injurious effect on the population of the country. But, independent of the harm which was done to the health of the women and children engaged in those gangs, the results to their morals were, it was clearly shown, most prejudicial. He would not quote in support of that view the evidence of the clergy, because, meritorious as were their exertions, it might be said by the employers of labour that their testimony was somewhat biassed. The existence of the state of things of which he spoke was abundantly established by the evidence of the women themselves, as well as by that of those by whom they were engaged. The first effect of the system according to that evidence was to give the women a hard, bold appearance and a rude manner, and to unfit them to make good wives or mothers, inasmuch as they were never trained to domestic habits. One labourer's wife said she did not like the gang system, while another stated that she would rather see her daughter enter the workhouse than go into the field. A large number of the employers of labour also admitted that they would prefer having girls excluded from such work. He might, however, be told that there was in some districts such a scarcity of labour that the farmers were driven to employ women and children; but his own opinion was that in many cases no such extraordinary scarcity existed, and that men were not employed so much as they ought to be, because the services of women and children were secured instead. In different parts of Norfolk wages were as low as 10s. or 12s. a-week for men, and the evidence showed that both men and grown-up lads were frequently out of work, while the farmers complained that their labourers were leaving them because of the low rate of wages. If therefore a check were placed upon the employment of women and children, it would, he had no doubt, be superseded to a great extent by adult labour. The hon. gentleman then quoted passages from the report of the Commissioners to show that a great many farmers had given up the public gangs, and that they did not approve the employment of a large number of children, even in private gangs. The Commissioners, he added, suggested in their reports several different remedies for the present state of things. They recommended that no gang master or middleman should be allowed to take out a gang without a licence from a magistrate; and when it was borne in mind that those men were very frequently convicted felons or thieves, or men in other respects of the worst character, it would, he thought, be admitted that it was desirable to have some hold of them, and to provide that their places should, as far as possible, be supplied by respectable men (Hear, hear). There could, he thought, be no objection to such a proposal, while he was also of opinion that the expediency of placing some restriction on the age of the children employed would be generally admitted. For his own part he thought no child should be employed in those gangs under the age of ten years, though some contended that the age might be very well fixed at eight. He should wish to see no children under ten years of age employed in public gangs; and he thought that the suggestions in the Commissioners' report against allowing children of different sexes to work together in gangs should be carried out, as the evils which arose from mingling them together were too gross to be mentioned. He should be glad if the House would adopt the principle that no young female under the age of 17 should be employed at all in public gangs. Indeed, he should like to see a prohibition against any employment of women in public gangs; but he did not think that such a restriction could be carried out. Recommendations were made in the Commissioners' report as to the hours of labour, and he thought that employment for eight hours a-day, including the time required for going to and returning from work, would be quite sufficient for children between eight and ten years of age. Between ten and thirteen years of age they might be employed for eleven hours, and afterwards for twelve hours. The Commissioners recommended that a certain amount of licence should be left to the local authorities, and that in some places the half-day system should be adopted. In other places it would be impossible to adopt that system, and for a certain period of the year —for three months or six months—it would be necessary to have a continuous school-time to make up for the continuous work-time in the other periods of the year. Another point for consideration was the improvement of the dwellings for the labouring classes, and the erection of cottages in the neighbourhood of the work. He believed that the farmers were beginning to appreciate the fact that a labourer having to walk a great distance to his labour had so much of his work taken out of him. Much benefit would result from the establishment of better schools in the district where the system of gang work prevailed; and Mr. Long, in his report, said that the extent to which children were employed in any parishes depended on the circumstance of whether or not there was a good school in the locality. In those districts there was a very great deficiency in shool accommodation, and in the diocess of Norfolk there were no less than 120 parishes in which at present no day school existed. When the children began to work, he thought that there would be no difficulty in setting aside a portion of their wages for their education, and he suggested whether it might not be expedient to give to the guardians of the poor the power to pay, in cases where they thought it right to do so, a portion of the school fees of the children. As many of the poor did not like the idea of receiving relief even for the education of their children, he would not wish to see the contribution from the guardians put on the footing of relief. He thought that the House was in possession of sufficient evidence to legislate on the subject of public gangs, and to place them on a better footing by proper regulations. The horrors disclosed in the Commissioners' report were greater than many hon. gentlemen could possibly conceive. If it could be provided that the gangs should be placed under the management of decent and respectable persons, then he would not be inclined to condemn the gang system altogether; but Parliament ought to take care that the masters of the gangs did not treat persons employed under them as slaves, and that they were people of good moral character. He repeated that he thought it would be well not to have females at all employed in the gangs, and he should be glad to learn from the Secretary of State for the Home Department whether he would be able to legislate on the subject during the present Session. The hon. member moved: "That in the opinion of this House the employment of women and children in agriculture should be regulated so far as may be by the principles of the Factory Acts."

Mr. FAWCETT, in seconding the motion, said no one could read the report without being convinced that a more pressing case for immediate legislation was never presented to the House. The facts disclosed were most startling, and demanded a strong and effectual remedy. Everyone passing through Lincolnshire, Norfolk, Huntingdon, Cambridgeshire, and the other counties where the gang system prevailed, and observing the magnificent breadth of corn land, must be struck with the melancholy reflection that such admirable tillage should have been produced by sacrificing the minds and bodies of hundreds of children, and by bringing women into a state of utter degradation. What had become of the county members? The member for North Lincolnshire piteously besought the House to come to the rescue of the poor farmers, because a murrain affected the beasts of the field; but he had not told them of this far more terrible plague which was ruining many hundreds of his constituents. They could not have a more striking argument to prove the fact that the interest of those not directly represented were not always well secured in that House. (Hear, hear.) Then, again, why had the Church told them nothing of this state of things? Peterborough was in the very centre of the gang district. How often had eloquent discourses been preached from its pulpits entreating those who heard them to do something to Christianize heathen lands! yet, within the shadow of that venerable cathedral, there were thousands existing in a state which, if they lived in distant countries, would have been pointed to, as unmistakable evidence to mark the barbarism of an uncivilized nation. The state of things disclosed by the report of the Commissioners had been more than verified by scores of letters he had received from the district. A few weeks ago he had received a letter from a well-known clergyman, who informed him that while riding along a public road with the archdeacon of the diocese they passed one of these gangs, composed of married men, women, and boys, when every woman committed a gross act of immorality which it was impossible for him to mention in that House. There was, he repeated, a necessity for immediate legislation. The evil had arisen from the utter want of cottages; and they must put such impediments in the way of the gang system as would compel landlords to build a sufficient supply of cottages. In one part of the district there were farms after farms of 300 acres on which not a single cottage was to be found. But it might be said, by placing heavy impediments on the gang system they would destroy it altogether. That was the object he wished to accomplish, which would not only immediately benefit the labourers, but ultimately be most advantageous to the landlords themselves. He went further than his hon. friend in the remedies he suggested. He would say that no child under 13 should be employed in these gangs; he would license gangmasters, and require them to show that they had sufficient means of lodging their gangs. Such enactments would operate as the heaviest discouragements to the system. The Earl of Leicester had recently made a speech on this subject, in which he detailed his experience with reference to the building of cottages, and showed the vast advantages landlords would gain by following his example. The gang system was only a branch of a much wider question. The report of the Children's Employment Commission showed that the ignorance of the children employed in gangs was only a sample of the general ignorance of the children of agricultural labourers. Indeed, the gangs could not be formed were there not an ignorant and almost pauper class from whence the children could be obtained. In his opinion, the alternate-day system was the only means by which the ignorance of the agricultural districts could be corrected. He would redeem his pledge of engrafting clauses upon the Bill of the right hon. gentleman the Secretary of State for the Home Department which would extend the operation of the Factory Acts to agricultural districts. Two objections had, however, been taken to that proposal—namely, that there would be great difficulty in inspecting the children, and that such an alteration would involve considerable expense, inasmuch as it would become necessary for farmers to employ adults instead of children in their agricultural operations. The difficulties of inspection might, however, be easily overcome, and the additional expense which the alteration would throw upon a farm of 1,000 acres would be under £20 per annum.

Mr. A. PEEL said that all who were interested in the condition of the labourer must feel grateful to the hon. member for Scarborough for the manner in which he had brought this subject before the House on that occasion. In considering this question it must not be forgotten that the provisions for education in towns were more numerous than in the country, and therefore it would be impossible to apply the provisions of the Factory Acts to the children of agricultural labourers without they were considerably modified. Agricultural employment was of a very peremptory and yet of a very desultory character, and it had, therefore, been suggested that the children should work during one half and be taught during the other half of the year. But if such a system were to be adopted, it would be found that the children would forget in one six months all that they had been taught during the previous six months, and therefore, in his opinion, the alternate-day, or half-day system was the best compromise that could be come to. One touching argument that had been used on behalf of the agricultural children was that, whereas the adult labourer saved and economised his strength, and took care not to overwork himself, the child, in its innocence and unselfishness, tasked its feeble strength to the utmost. The House was, therefore, called upon to protect the child from the consequences of its own unselfishness. He wished to draw the attention of the Home Secretary to a particular kind of labour that had come under his especial observation—namely, what was called the coprolite manufacture, in which a large number of women and children were employed, in the counties of Bedford and Cambridge. He had made some notes of the state of things in two of those coprolite mills. In the first, which was a small mill, 35 men, women, and children were employed, among whom were three female children from five to seven, and three from eight to ten years of age. The education of all these labourers was on the whole fair. The second case was of a very different nature. In that mill, which was a large one, 196 men, women, and children were employed, of whom 20 were women, 26 were children of from five to seven, and 23 from eight to ten years of age. Of the 196 individuals 91 could read, but only 48 could read and write, and their education was of the very lowest and most imperfect character.

An Hon. MEMBER inquired what process was used in this manufacture?

Mr. A. PEEL said that the coprolites were first dug out of the earth by means of a pick, and then were gathered up and taken to the mill, where the women and children were employed in selecting the true from the false coprolites, in doing which it was necessary to use water. The coprolites when chemically treated furnished the best superphosphate of lime. He had seen instances of tyranny on the part of the gang-masters towards those under them, which would make one's blood run cold. It was imperatively necessary that the gang-masters should be required to have a certificate, and there should also be a proviso that they should not be publicans or innkeepers, otherwise all the evils of the truck system would be revived (Hear, hear). He had seen men at the end of the week going for their wages, and instead of receiving money for their labour they were obliged to truck or barter, mostly for drink sold at a price fixed at the discretion of the master. He therefore hoped that that fact would be kept in view, in any legislation which might take place on that question. The subject of education was intimately connected with that of the employment of women and children in agricultural gangs; but there was one kind of mis-named education by which the House ought not to suffer itself to be misled. At the town of Luton, in Bedfordshire, the great head-quarters of the straw-platting trade, there were so-called platting-schools, in which the worst tyranny was practised in regard to the exaction of youthful labour for the sake of the platting trade, with the least possible reference to any educational training whatever. The inspector of that district mentioned 33 of these schools, in which straw platting and reading were supposed to be combined; and of the 1,015 children attending those 33 schools, he classed the whole of them in the category of children who were deprived of the benefits of education owing to the demands of labour. Those "schools" were nothing less than low, hideous, damp, and fœtid factories; and it was to be hoped they would be brought within the scope of the proposed beneficent legislation. He trusted the House would endeavour to protect those who could not protect themselves from the double danger to which they were exposed—first, from the danger of missing all, or nearly all, the advantages of education; and, secondly, from the tyrannical exaction of what little residue of health and strength they possessed (Hear, hear).

Mr. F. S. POWELL much regretted that the hon. member for Brighton (Mr. Fawcett) should have taken advantage of that occasion in order to make remarks hostile to a large class of English society—namely, the clergy and the owners of land. The hon. gentleman had also thought fit to re-open the question of the cattle plague, which certainly had no relation to the present discussion, and the introduction of which could not possibly facilitate legislation in reference to organized gangs. Now, all who had read the report of the Commissioners must have observed the extreme anxiety evinced by the clergy to put an end, at once, to every evil connected with the gang system, and the hon. member for Brighton must have been unhappy in his acquaintance if he had not found that there now existed a wide-spread desire among the country gentlemen to ameliorate the condition of those who lived on their estates, and to provide better dwellings for the families of labouring men, who were unfortunately too often ill-housed. It was only by exacting severe labour from children that a profit about equal to that of ordinary day labour could be made by those who led these gangs; and human nature being what it is, great cruelty and hardship would frequently be inflicted by these men upon those under them. The Rev. Henry M'Kenzie, rector of Tydd St. Mary, in his evidence described the evil effects of the employment of women in field-work, enumerating among them the loss of self-respect, dirty and degraded habits, slovenly and slatternly households, the alienation of husbands by the discomfort of their homes, the great neglect of the education of children, drunkenness among the men, and the consumption of opium among the women. The evil effects of employing girls in that manner comprised—first boldness, next ignorance, then unchastity, want of cleanliness, incompetency in sewing, mending, cooking, and other household work, indifference to parental control, and unwillingness to apply themselves to any regular employment to gain a livelihood. The state of the law previous to the passing of the Union Chargeability Act had a great deal to do with that matter; and all who had aided in carrying that measure must be delighted to find that it was already helping forward the improvement of the condition of the people. Unlike manufactures, agriculture was dependent on the weather and the seasons of the year. Periodically, therefore, there was a great demand for labour all over the country, and at other times scarcely any such demand. Some kind of migratory labour was, consequently, necessary for agricultural operations. It was well known that bands of humble Irishmen came from their own country to gather in the harvests of our northern counties. Still, though migratory labour could not be entirely done away with, their attention ought to be directed to the best means of regulating it and preventing the mischiefs arising from it. Another cause of the evils which had been referred to was the low moral tone which undoubtedly existed in some parts of the country. The evidence contained in the sixth report of the Children's Employment Commission disclosed that parents in the receipt of ample wages sent their children to labour in these gangs. The remedy for these evils might be divided into two classes—the one self-acting, and the other dependent upon legislation. In the first class might be included the multiplication of houses, which would bring the children nearer to their work; and next, an improved cultivation of the land, whereby it would become better cleaned. One witness said that the quantity of weeds growing upon the fen land was becoming less every year. A third remedy in this class was the introduction of machines to do the work now performed by children. Parliament must legislate on this subject, but should proceed with caution. It was stated in the report that, in many districts, the condition of the labouring class was so good that they declined to employ their children in the gangs. If Parliament were too severe in its legislation, and attempted wholly to suppress the system, he feared that it would re-appear in some shape which would evade legislation, and which it would be difficult to bring into order. The hours of labour must be restricted, and, if so, it would be necessary in the same Act of Parliament to impose education. Legislation must be uniform and not leave too much to the localities. If a licence were to be given to the masters of gangs, it must be given under stringent conditions, after due investigation into the character of the applicant, and taken away promptly in cases of misconduct. He trusted that the Home Secretary would remember that the whole field of agricultural labour should be gone into (Hear).

Mr. READ said that all must acknowledge the moderation and fairness with which the hon. member for Scarborough had introduced this subject. He went a long way with the hon. member in condemning the evils of the gang system, and in many of the remedies he proposed. He did not, however, believe that public gangs were so numerous as they used to be, and bad as they were at the present time, they were much worse a few years since. He could endorse the truth of the statement made by the hon. member for Warwick, that it was customary a few years ago for the head of the gang to keep a public-house or beer shop, and to pay the wages in drink, &c. He agreed that mixed public gangs were an unmixed public evil. By all means license the master, separate the sexes, and limit the distance of walking to the place of work, if they pleased; but pray let the House be reasonable and moderate. Let them keep out boys under nine from the gangs, and girls under thirteen, but not go the length of some of the recommendations contained in the report, one of which was that all the females under 18 should be excluded, while some declared that no women should be allowed to work in these gangs. In this free country it would not be well to put this fetter upon free labour. There was a difficulty in providing employment for females of all classes, and there was a growing superabundance of women in agricultural labour, owing to the migration of the men into towns and the numbers of those who left this country for foreign shores. Many young women if not employed in this way, would go into idleness. It was all very well to say that they ought to be employed as domestic servants; but if they did not wish to be so employed, Parliament would not be justified in depriving them of one description of labour in order to force upon them another. Then it was said that field work was detrimental to the refinement and delicacy of women. It did not, however, follow that because they were coarse and rough that they were also immodest and immoral. He believed that female immorality was not unknown either in manufacturing towns, in barn kitchens, or the servants' halls of the "upper ten thousand." (Hear). The mixture of boys and girls in field labour was not an evil so great as the crowded state of the cottages, for when young persons of both sexes herded together in the same room, they grew up with no sense of decency or delicacy. It was singular that the arguments stated to be used by the mothers against allowing their daughters to work in the gangs were the same which were used to himself when he asked the reason why they did not send their daughters to school. One woman told him one of her daughters caught a fever at school and died, and on no account would she send another. Another said her daughter caught rheumatism from the cold and wet of the journey. A third said her girl got into bad company, which did her more harm than the school did her good. With regard to the causes of the ganging systen, 60 years ago the land which in Norfolk produced rabbits and bustards, and which in Lincolnshire produced the stork, the bittern, and the snipe, was now covered with fleecy flocks and waving corn. There were neat farm buildings and good roads, but not many cottages. The question in these days was not how to get labour, but how to employ it, and he must bear his testimony to the way in which the land-owners were building cottages. Every farmer would gladly pay 5 per cent. for any outlay of this kind. The employer of agricultural labour was treated, as a rule, in a very different manner from that in which the employer of manufacturing labour was treated. The manufacturer might shut up his mill or work half time without his conduct exposing him to remark; but a farmer could not cease growing or be stingy about the employment of labour without being reproached with not being a good citizen. The farmer, indeed, was driven to the employment of these gangs, and did not employ them as a matter of choice. No labour, in his opinion, was so bad or so costly as this kind of labour, and he assured the hon. member Scarborough that the gang system did not supplant real good labour, and that it in fact only existed where that real and good labour could not be obtained. The hon. member for Cambridge had suggested that improved machinery might supersede the necessity of employing these women and children; but there were some things that machinery could not do, and never would be able to do, and this was especially the case in some departments of agriculture. In manufacture machinery was employed for working on material in a uniformly good and excellent condition; but in agriculture it was very different, and the farmer had to contend against different descriptions of land as well as different descriptions of crops. He did not, however, believe that if properly managed these gangs were altogether bad. It would too, he thought, be a mistake to keep the agricultural labourer too long at school. Boys kept at school until they were 13 or 14 years of age might make very good indoor servants, but they required the hardy training which could only be gained from an outdoor employment while young to qualify them for the work of agricultural labourers. The intermittent system of education might be very easy in the case of farmers living near the manufacturing towns, where relays of boys could easily be obtained; but in the purely rural parishes it would be found more difficult to adopt such a system. They had, however, a saying in Norfolk to the effect that one boy was equal to half a man, two boys to half a boy, and three boys to no boy at all. (Laughter).

Mr. FORSTER thought the debate of that evening must convince the House of the progress that had of late years taken place in the minds of the public on this question. The exceedingly moderate and excellent tone of the hon. member who had just sat down, and who, as they all knew, sat in that House as the representative of the farmers, was in itself a proof of that fact, for in all attempts to improve the condition of the juvenile or female labour, the opposition to the improvement had invariably come from the employers of that labour (Hear, hear). The hon. member, however, evidently felt that the case presented to the House was so strong that he did not pretend to oppose legislation on the subject, but simply to direct the manner in which that legislation should be applied. For his own part, he rose for the purpose, without any practical knowledge on the subject, and judging merely from the Report, to suggest that the matter should not be legislated upon without further information. The House ought to have some information with reference to the private as well as to public gangs (Hear hear), otherwise the effect might be simply to lessen one evil by promoting another (Hear, hear). In any case it would not, he believed, be possible, or, at all events, advisable, in respect to education, to apply the provisions of the Factory Acts to this kind of labour. Still, however, the public would not much longer remain quiet while the children of the agricultural labourers of this country were allowed to grow up untaught or certainly less educated than children engaged in other employments. Speaking from his experience of factory legislation, he trusted his right hon. friend would not legislate on this subject without providing for ample inspection, without which all enactments would be useless. Even delay was preferable to more speedy legislation if that delay resulted in a more complete and useful measure (Hear, hear).

Mr. GREEN tendered his thanks to the hon. member for Scarborough for having introduced this question. As the farmer of a large estate, and one practically interested in agriculture, he could endorse what had been said of the deplorable state of the agricultural population, but reminded the House that the question had its bright as well as its dark spots. He cordially assented to the proposition that women should not be employed in the fields until they were at least 17 years of age, because then he believed they would never be employed at all (Hear, hear). Field labour unfitted girls for domestic service, and induced immorality, and on these accounts the question peremptorily demanded attention; but the employment of boys also required regulating. There was no intermission of the labour of boys, so numerous were the jobs to which they were put, and although Englishmen were averse to compulsory measures, he thought it would be well to forbid the employment of a boy who could not read or write; indeed, without such a regulation he thought it would be impossible to get the poor properly educated. On making inquiry he found that scarcely any of the boys on his farm could read or write, and he sent them to an evening school; but that had remedied the evil as far as his farm only was concerned. He thought it a mistake to suppose that field labour hurt young people physically (Hear, hear): the evil was a moral one; and in gangs, of which he knew little, he presumed it was to be found in the indiscriminate mixture of boys and girls. He had found that female labourers might be dispensed with, and with regard to cottages, it was clearly the interest of the landowner to build them. He thought the condition of the rural districts was not quite so black as it had been painted, as an instance of which he might mention that in his own neighbourhood a tenant farmer had presented a reading-room for the use of the labourers of the parish. He objected to agricultural employment being tacked on to the Factory Acts, but he believed a separate measure might be framed which, while no hardship to the farmers, would be of great advantage to the labourers.

Mr. WALPOLE remarked that the discussion had clearly shown the impossibility of dealing with field labour in the same way as labour in factories. The subject had been introduced by the hon. member for Scarborough with great ability, and he cordially assented to the resolution which the hon. gentleman had moved, on the understanding that it did not imply that the employment of women and children should be placed under exactly the same regulations as factories, but that the principles of the Factory Acts should be applied to it as far as practicable. Whether immediate legislation could be founded upon the resolution was open to doubt, for only public or organized gangs had yet been reported on, although the evils attending private gangs were equally great. He had considered the subject a good deal since reading the sixth report of the Royal Commissioners, and he had ascertained that Mr. Tremenheere was of opinion that the inquiry ought to be extended to private gangs. He thought, therefore, the best plan would be to re-appoint the Commission for that purpose. The inquiry could probably be completed by the end of the autumn or beginning of the winter, and the House would then be in a position to legislate with regard to the employment of women and children in gangs of any kind. Whether the employment of women and children in agriculture generally could be regulated was a larger and more difficult question, which must, he thought, be postponed to a later period. In the meantime, he heartily supported the resolution proposed by the hon. member for Scarborough.

Sir H. VERNEY expressed disappointment that immediate legislation was not instituted, since he thought the Commissioners had already reported on private gangs, and on the general employment of women and children in agriculture, and that their report presented ample materials for Parliamentary action. Some of the evidence which had been taken was in favour of compulsory education, and there might be some stipulation with respect to the age and acquirements of children allowed to labour. Parliament certainly ought not to permit another year to pass without ameliorating the disgraceful state of things which existed in some parts of the country.

Mr. NEWDEGATE reminded the hon. baronet that the Fens had not till late years been habitable, so that the animadversions of the hon. member for Brighton with reference to the non-building of cottages were misapplied. The evils which required a remedy had arisen from the new system of farming; for whereas formerly labourers lived near the farmer or under his roof, the economic principles which had been applied to agriculture had changed all that, and had led, among other things, to the growth of the gang system.

Mr. DENT, in replying, expressed gratification at the recognition of the evil by practical agriculturists on both sides of the House, and left it to the Government to determine whether or not they had sufficient information to justify legislation, only trusting that whenever a measure was introduced it would deal with the whole question of the employment of women and children in agriculture.

The resolution was then agreed to.

THE AUSTRALIAN TRADE.—The value of the imports made into the United Kingdom last year from the Australian colonies (including New Zealand) was £11,423,268. In 1865 the total was £10,273,113; in 1864, £10,039,332; in 1863, 7,160,666; in 1862, £7,109,809; in 1861, £6,901,487; in 1860, £6,469,243; in 1859, £5,834,641; in 1858, £5,291,287; and in 1857, £5,925,305.

CENTRAL FARMERS' CLUB.

A BOARD OF AGRICULTURE.

The monthly meeting of the Club took place on Monday evening, April 1st, in Salisbury-square, Mr. Little in the chair.

The subject fixed for discussion to be introduced by J. A. Nockolds, Stort Lodge, Bishop's Stortford, was "The desirability of a Board of Agriculture as a Government department."

The Chairman, in opening the proceedings, said: Gentlemen, the subject on the card for this evening's discussion was placed there in consequence of a communication having been received by the Secretary of this club from the Dorsetshire Farmers' Club at the commencement of this year. That communication was that the Dorchester Farmers' Club had recently held a meeting and passed the following resolution:—"That it is the opinion of this club that it is desirable that the Government should be memorialised to appoint a Board of Agriculture, and the secretary do communicate with the secretaries of the Central Farmers' Club and other farmers' clubs, by printed circular, to ascertain their views upon the subject, in order that common action may be taken, if deemed advisable." The committee of this club thought it desirable that, before they gave an answer to that communication, the subject should be discussed in this room. At the meeting at which they came to that conclusion our friend Mr. Nockolds kindly undertook to introduce the question. It appears to me that the discussion will be very opportune now, in consequence of a Central Chamber of Agriculture having recently been formed, and various local Chambers of Agriculture throughout the country. These increasing bodies scarcely know to what member of the Government to apply in case of need, and at the same time they feel that if left to Parliament generally they will be trusting to a broken reed. I repeat, therefore, that the subject on the card seems to me very opportune at the present time, and I have no doubt that Mr. Nockolds will give us a very useful and interesting paper (cheers.)

Mr. J. A. Nockolds said: On bringing the subject for this evening's discussion before you, I may perhaps be allowed to say a word or two in explanation of the reason which induced so uninfluential a member of your society as myself to undertake a matter of so great importance to the agricultural world, and one which has caused, and is causing, so much controversy in the several chambers, clubs, and other societies connected with agriculture. On the 7th January last I first took my seat at the board of your Council, and during our sitting a letter was read by our Secretary, which had been forwarded by the Secretary of the Dorchester Chamber of Agriculture to your Council, inquiring what steps were intended to be taken by it on the question of a "Government Board of Agriculture," and counselling "unity of action." I may not be quite correct as to the terms of the letter, but I believe I give the substance of them. The words I have mentioned, "unity of action," gave me the opportunity of saying that if the letter of the Dorchester Chamber had not been read, I had intended, after the routine business of the meeting had been got through, to have brought before the Council the question of the propriety of this club opening a communication with the Central Chamber of Agriculture, to secure, when and where desirable, a unity of action in matters which were likely to affect the interest of all who are engaged in, or affected by the culture of land—in fact, that the proceedings and opinions of the different Chambers of Agriculture and Farmers' Clubs might, by some means, be brought to a powerful focus and turned to such account as the directors of it might deem best. A remark was then made that "unity of action" was but a very vague and general term, which doubtless it is, but that the "desirability of a Board of Agriculture as a Government department" would be an excellent subject for discussion, if any one could be got to bring it forward. Urgent calls were eventually made upon me, and being always of opinion that no person should undertake an office, or willingly fill any position of trust without being prepared to accept such duties as his colleagues may consider he ought in fairness to undertake and fill, I, remarking then as I shall do now upon my unfitness for and inadequacy to the task, responded to those calls. In approaching this subject I found it to be somewhat of the hedge-hog genus: on whichever side I wished to grapple with it, I found it equally beset with difficulties of handling. Precedent, however, if I could find any, at home or abroad, seemed to offer, at all events, some *locus standi* for the gleaning of facts and formation of opinion; for I must here say, that until the very day, or thereabouts, that the subject was named to me, I had never given it a thought; I come, therefore, to the task on this most ominous day, with no pre-conceived opinions upon it. First, then, was there anything like a precedent at home for a "Board of Agriculture as a Government department?" Well, not entirely so; but something very like it. I am old enough to recollect my father and others talking of a Board of Agriculture, and of Arthur Young its secretary. So to gain some information relative to this board and its doings, I in the first instance applied myself. I found that its proceedings were published under the title of "Communications to the Board of Agriculture." I found also that Sir John Sinclair, its first president, then in opposition to Pitt the Prime Minister of the day, had made several ineffectual attempts to establish such a board,—so many, that Arthur Young (who he had promised should be the secretary) laid him a wager that he would not succeed. This wager was his (Young's) complete set of "Annals of Agriculture" against a set of Sir John's "Statistical Account of Scotland." I don't think the loser would be much punished. I may be excused remarking here, that Sir John appears to me to have been, if not the inventor, a very great promoter of agricultural statistics; and there is one thing I honour him for, and that is his great devotion to all matters connected with sheep and the growth and supply of wool, a most important joint in the back-bone of British commercial and agricultural prosperity. But to get on. It would seem that agricultural matters in those days did not meet with overwhelming attention from Government, any more than at the present time. On 10th January, 1793, Young writes thus to Sinclair: "You are going to Mr. Pitt, and I am to lose the wager. When you come from Mr. Pitt I shall have won it. Pray don't give Ministers more credit than they deserve. In manufactures and commerce you may bet securely; but they never do, and never *will* do, anything for the plough. Your Board of Agriculture will be in the *moon* (I am afraid ours will fare no better). If on *earth*, remember, I am to be secretary." And so he was. Some time in that year, I think, the Commons voted an humble address to his Majesty George III., that a Board of Agriculture be established, and that they would defray its expenses to the amount of £3,000—no great amount, certainly; but then, you know, it was only for Agriculture. Sir John introduced his motion with a long and able speech, stating that, in the first place, the institution would be a magazine of agricultural knowledge, and board of reference; secondly, it would promote agricultural surveys; thirdly, it would enter into extensive correspondence; fourthly, it would have the privilege of franking (correspondence being an enormous expense in those days); fifthly, it would further the improvement of stock; and last, but not least, it would furnish statistical accounts of the agricultural productions of England. A charter was granted, 21st August, 1793; and, in conformity with its stipulations, the board was called "The Board or Society for the Encouragement of Agriculture and Internal Improvement." It was endowed with a common seal, granted diplomas (one of which may yet be seen in the counting-house of Mr. Gibbs, the agricultural seedsman, in Halfmoon-street, Piccadilly), and was composed of all the principal Ministers of State, the Archbishops of Canterbury and York, the Commander-in-Chief, and, I think, the Lord High Admiral, *cum multis aliis*, as *ex-officio* members, and a working staff of noblemen and commoners. In his first presidential address to the Board, Sir John said it would be of service to agriculture in two respects—firstly, by removing all *dis*couragements to rural industry; and secondly, by granting *en*couragement thereto. Alive to his statistical proclivities, he recommends the filling-up of tables (of which he gives a form) of farm-produce by tenants and occupiers of land, but "not unless perfectly agreeable to the inhabitants of the district." Out of the very munificent grant of £3,000 per annum, £500 was set apart for the payment and compensation of those gentlemen who executed the surveys of the several counties; and, if three or four were surveyed and reported on in the course of a year, even the editor of the *Field* himself could not have classed the reporters among his *over*-paid surveyors. In fact, Young's "Essex" must have been, at that time, worth the total sum. Sir John, as some of you are perhaps aware, made a very extensive tour, chiefly in the North of Europe, and was long after in intimate correspondence with crowned heads and other magnates of the countries he visited. Such a sight had not been seen before, and, I venture to say, never will be again, of the friend and advocate of agriculture generally, and of British agriculture in particular, being received with every courtesy and honour at the tables of Royalty itself, and greeted with complimentary attentions by the good and great of many nations, and this absolutely and solely in regard to his connexion with, and his anxious strivings for the welfare of, the agricultural interest. I may say, perhaps, that there is some slight evidence of his not overlooking Sir Pertinax McSycophant's advice, to "keep booing, keep booing, always keep booing;" but on the whole, he was an energetic, practical, clear-headed man, whose heart and soul were devoted to the well-being of the agriculturist. He had, however, in his mind a somewhat Utopian crotchet of a plan of an agreement among the Powers of Europe and the United States of America, for the purpose of rewarding discoveries of general benefit to society, such as increasing the quantity of animal and vegetable food, improvement in medicine, means of saving fuel, and construction of houses for the poor. And now, as to the practical working of this Board; let me just state a few of the sorts of things for which they offered prizes. The first note I have is, that a Committee of the House of Lords offered, through the Board, certain sums, to be given to those who would examine into, and report to their lordships "the best means of converting grass lands into arable without exhausting the soil, and of returning the same to grass, after a certain period, in an improved state, or at least without injury." First prize £200, second ditto £100, third ditto £60, fourth ditto £40. A silver medal for the means of ascertaining the probable state of the weather. Gold Medal for the best account, with drawing, of the various instruments of husbandry. Silver medal for best and cheapest cottage; ditto, for oven for cottage; ditto, for bed and bedding for cottage. Gold Medal for a plough, which will with the least force turn a furrow not less than 6 inches deep and 9 inches broad. Gold Medal for best cart, &c., &c. And what was the world's opinion of all this? Did it think such a Board of Agriculture desirable, as (partially) a Government department? It appears that, for some years, at all events, it did. Let us see what was written and said on the matter. Foremost is a letter written by command of His Majesty Geo. III., by his private Secretary in 1794, in which his Majesty was pleased to say, "That he considers the success of the Board of Agriculture as a concern which very essentially interests the general good of the community at large, and that he shall consider every person who comes forward with his assist-in this business as contributing importantly to the good of his country." In 1810, Sir John was made a Privy Councellor, and then had an interview with "Farmer George," who spoke to him kindly on the then state of the crops and of the harvest in Scotland, adding that he had heard a great deal of the husbandry of East Lothian and of Berwickshire. Dr. Watson, Bishop of Llandaff (a man of great intellect and a celebrated divine), during his residence in London regularly attended the meetings of the board, and in Nov., 1795, writes thus to Sir John: "I have not sent any subscription to the board—not from a desire to save money, but from a stern reluctance to assist by private donation a board which ought to be liberally supported by legislative munificence." Earl Bathurst, President of the Board of Trade, being informed of Sir John's wish to become a Privy Councillor, because his object was to be appointed a member of the Board of Trade (it frequently happening that points of great importance to agriculture were referred to that board), writes thus in July, 1800, to Sir John: "I shall be very happy to have your assistance at the Board of Trade. In answer, however, to an observation of yours, I must in fairness say that the attention of the Board of Trade is so much engaged in commercial questions, that they never engage, unless it is unavoidable, in agricultural discussions—(Is this so now?)—which have wisely devolved upon a board over which you have with so much ability presided." Surely this is a good argument for again establishing another board. But perhaps the most energetic and warm friend to Sir John and his measures was that great man Washington. Simple in nature as a child, no sooner has the battle been won and his country released from its foes, than he hastens to turn his sword into a ploughshare and his spear into a pruning-hook; no sooner has it chanced that victory has declared for the oppressed, than he sheaths that sword, and, grasping in friendship the hands of his late enemies, stands before the world, fully possessed of "that most excellent gift of charity which is the very *bond of peace*." No sooner had it chanced, did I say?—let us add in the words of Spencer the poet, "Eternal God *that* chance did guide." Time has smoothed factious asperities and national prejudices, and we can without reluctance or demur accord our tribute of respect and admiration of this upright and honest patriot. He gives Sir John a short abstract agricultural survey of the United States, and continues for years in correspondence with him on the subject most congenial to both—the improvement of agriculture; comparing and testing samples of wheat, sending them to his correspondent, and, in fact (though burthened with the supreme authority of the State), stealing every moment he can from the cares of office to devote to his favourite pursuit. I will conclude my observations relating to this celebrated character by an extract from a letter sent to Sir John Sinclair, Jan. 20, 1799, first informing you that Lord Somerville had been elected President of the Board of Agriculture in the place of Sir John: "It is not for me, sir, to express any opinion with respect to the change in the presidency of the *National* Board of Agriculture; I have no doubt but that Lord Somerville is a very meritorious character, and well deserves the honour to which he is elected. I am also perfectly well satisfied that no one, as far as my opportunities have enabled me to judge, could fill that office with more zeal, more honour to himself, and more usefulness to the public than Sir John Sinclair." But I must hasten to close this division of my subject by stating that many of the great potentates and nobles of the age expressed their strong approbation of this Board of Agriculture and its first President, who, as far as I can understand, was the primary cause of the establishment of similar Boards or Agricultural Societies in America, France, and other foreign countries. Can we then from this precedent draw a conclusion favourable to the "Desirability of a Board of Agriculture as a Government Department"? In some degree I think we can. The former Board certainly was in its day of vast service to the cause it advocated, even if the county surveys and reports be alone considered; but I am bound to admit that the same sort of results which were effected by it, have been and are being effected by the Royal Agricultural Society of England, the Highland Society, and other institutions of a similar nature. The question may be naturally asked why, if so much good resulted from Sir John's Board, it was discontinued? I have failed to find an answer to that question. All I know is, that it was put an end to by Lord Liverpool in 1819, and that in 1818 Sir John says: "From anxiety to procure accurate information regarding the husbandry of Flanders, I had prevailed upon the Board of Agriculture to offer a premium of £200 for the best account of Flemish Agriculture. But before the papers transmitted to the Board in competition for that premium had been examined, the Minister of the Crown (Lord Liverpool) had resolved to extinguish the Board, and orders were given that all the papers belonging to that institution should be desposited in the Tower of London, where they are still kept, inaccessible to the perusal of anyone, as if manuscripts full of information of the highest importance to the agriculturists of the country ought to be carefully concealed as prejudicial to the public interest!" In the name of all that is liberal, equitable, and just, why was this? Fit precedent to the collection of agricultural statistics by the police. But then you know it is *only* Agriculture that suffers! I now come to the second part of my subject. Is there anything like precedent or example to be found abroad in the institutions of foreign countries? Now, you must not imagine that I am going to show you "all the kingdoms of the world and the glory of them." I have neither time nor ability to go much into detail upon this division of my paper; but I trust to show that what some of us think unnecessary is deemed to be quite the reverse both by despotic and democratic governments—that is, a State Department of Agriculture, presided over in several instances by a Minister.

Russia.—In turning to Russia as an example of despotic government, I am compelled to say that I have been able to glean but little as to the question before us. You are all well aware that, until very lately, the agricultural labourers of that empire were serfs, or thralls—in point of fact, little better than slaves. The Emperor, however, having, I believe, manumitted the Crown serfs, and evincing a disposition to encourage the manumission of the remaining serfs by their lords, the nobility and landowners of Russia, the industrial economy of that empire is in a transition state. The few remarks I shall make will be applicable to the state of matters previous to the manumission of the Crown serfs. First, then, I will just state that a serf gives to his lord generally about three days work per week towards the cultivation of the estate, and that he and his family are supported on about three acres of land, on the average, cultivated by him on the other three days. But an immense number of Saints' days occur in the Greek Church, which are kept as holidays, and these are subtracted from the lord's or the serf's portion of the working week. There is a law in force called "The Inventory"—a sort of sobriquet, for there is little in its nature to justify the name—which protects, when properly carried out, the serf from the exactions of his lord; but as the priests are the chief expounders of its provisions to the ignorant serfs, and as they (the priests) are very venal, but little benefit results from it to those whom it was intended to protect. This is, however, a direct interference of government as regards the agricultural labourer. Leases also, which are generally for three years, are granted by the landowners to others (often Jews, though strictly speaking it is illegal to let to a Jew) desirous of farming an estate with its indigenous horde of serfs. These leases are under the supervision and sanction of government, and cannot be executed without its sanction. Certain duties are payable to the Emperor by means of stamps, and the leases are *registered* in the local court of the district where the property leased is situate—another direct interference of Government. In 1792 there was an "Imperial Agricultural Society of St. Petersburgh," and Sir John Sinclair was admitted a member. In answer to inquiries lately made, if there were any Government department of agriculture in Russia, I was told, "No, excepting Le Départment d'Economie du Ministre du Domaine Impérial à St. Petersbourg"—which, it strikes me, must be something in the nature of our department of "Woods and Forests." However, everything except a man's soul appears to be a Government institution in Russia, and all matters of whatever nature are submitted to military arrangement and discipline. That much remains to be done for agriculture in Russia will be apparent when I tell you that so late as 1850 they burned their manure, or mended such roads as they have across their rich alluvial plains with it, although these lands are beginning to feel the constant pull of two white straw corn crops in three years without manure. The means of transit are also deplorable, and immense wealth must be lost in time and labour of transport; but a thousand or so of bullocks perishing in their return from the seaport on the arid steppes go for nothing. Altogether our question is not much forwarded by a reference to Russia.

Prussia.—As to Prussia, which may be termed, to a certain extent, a representative government, I have the following information: Until the year 1848, all matters relating to agriculture were conducted in the office of the Minister of the Interior, or, as we should say, I suppose, the Home-office, a separate division being set apart for them; but in that year, for the better promotion and protection of the agricultural interest, a special Minister was appointed, having in his department, and under his supervision, the following, viz.: 1. The enfranchisement of feudal tenure: This is not the same as our copyhold enfranchisement, though somewhat analogous to it. The cultivators of the soil were bound to render certain services to their lord in the shape of rents paid in kind, and a portion of their time for labour. These rents, with the tithes, formerly also paid in kind, are now commuted, as with us, into a money payment, inclusive of the portion of time mentioned. And the Minister also has under his control what answers to the powers of our General Inclosure Act, as respects open and common arable fields, namely, "the laying together of pieces of land." 2. The improvement of land; regulation of rivers, canals, &c; management of the woods and forests, dykes, water-courses, and main-drainage. 3. The establishments for promoting the breeding and rearing of horses, which is a matter of great importance in Prussia. 4. Agricultural schools and colleges, with experimental stations or field laboratories, where scientific agricultural experiments are carried out, after the manner of Mr. Lawes, at Rothampsted. 5. Agricultural societies and exhibitions. 6. Measures for advancing the cultivation of the land in general: These embrace a wide scope; but at present not much benefit has resulted from them. Among them may be noted the mission, encouragement, and support of students of agriculture, drainage, engineering, &c., on journeys of improvement; and the publishing of works on agriculture. To the Minister for Agriculture and matters connected with land appertains an agricultural board, composed of the most eminent agriculturists of the country, whom, as occasion requires, he consults. This board is assembled once or twice a-year at Berlin, for the consideration of important matters, at the request of the landowners and others interested in agriculture. Every member can himself bring forward any proposition for discussion which he may think worthy of consideration. The board, however, can only tender advice and counsel; and the Minister is not bound by its conclusions. Where agriculture predominates in a State, as in Prussia, it is fully justified in having a Minister of Agriculture. The beneficial working of the system in that country has made itself felt in various ways, particularly with regard to the carrying out of suggested improvements, and the breeding and rearing of horses. Agricultural instruction also is satisfactorily advanced through the ministerial office, whilst of late attention has been paid to the education of the peasantry, or the class who are represented as nearly as may be by our labourers, in the lower or elementary schools. As we shall see presently in reference to France, there are schools where the young peasants perform all the operations of husbandry themselves, and thus become acquainted with the use of the various implements and tools. The colleges and upper schools of agriculture also largely conduce to the attainment of scientific agricultural knowledge, exclusive of the elementary tuition and the schools for teaching practical husbandry just mentioned. My correspondent is of opinion that to obtain a supply of efficient teachers of agriculture for the country at large, the heads of the training colleges for masters should give their pupils a well-grounded education in the natural sciences (physics) and in agriculture. Without going into details he remarks that, generally speaking, all are satisfied with the working of the ministerial department of agriculture in the country now under notice, but there is a general opinion that it should embrace the crown lands and forests, for he says: "These form a considerable portion of the resources of the State, and ought not to be regarded only as sources of finance, but that through care and good management their value should be raised, which care and management it seems natural should be under the Minister of Agriculture." At present they are under the control of the Minister of Finance. Whilst so near Germany I must just mention the renowned Agricultural College of Hohenheim, one of the oldest establishments for agricultural education in Europe, near Stuttgard, in the Kingdom of Wurtemburg. This institution consists of three separate schools, namely, what may be termed the high school or academy, the agricultural school, and the horticultural school. In the first, students are admitted of not less than 18 years of age, who are proficient in preparatory studies and are desirous of further advancement in agricultural knowledge that they may manage their own estates and the estates of others; the course is two years in duration, and consists of lectures and practical demonstrations. The agricultural school is independent of the foregoing, and was instituted for the purpose of creating a class of thoroughly practical stewards or overseers of small estates, who will take the plough in their own hands; also to teach small proprietors intending to farm their own estates how to perform necessary agricultural operations with their own hands. A great portion of their time is spent in agricultural labour on the farm, but they receive instruction from professors two hours each day, in the lecture-room. No foreigners are admitted under any circumstances to this school, but the twenty-five pupils to which it seems limited must be natives of Wurtemburg. The course embraces three years. As to the third school, for horticulture, I need not enlarge upon its objects, which are sufficiently apparent from its title. There are in addition to these schools, educational courses annually, on fruit growing, management of grass land, shepherding, and school-teaching. The farm attached consists of 778 acres: the director disclaims the idea of its being a *model* farm in the usually accepted sense of that term, but it is intended to demonstrate improvements, such as a rational rotation of crops, thorough culture of the soil, proper treatment of manures, under-draining, irrigation, &c. The live stock consists of 10 farm-horses, 90 cows and heifers, 28 working oxen, and 1,000 sheep. There are botanical and vegetable gardens, a vineyard, and a nursery, and experimental fields: on these the effects of different manures, rotation of crops, succession of the same crop for several years, excessive manuring, thick and thin seeding, broadcast or drilled, are shown. There is a sugar-beet factory, brewery, distillery, malting, several other factories, a roof-and-drain-tile manufactory, and an agricultural implement and machine manufactory. Silk-worm and flax-preparing departments, and also a large forest are attached. Seeds are distributed to the farmers of the kingdom, and there is an annual sale of bulls and rams (I suppose), for my American author says "bucks." In fact, it would occupy me till ten o'clock to make you thoroughly acquainted with this Government institution.

France.—The Agricultural Department in France is presided over by a "Minister of Agriculture, Commerce, and Public Works." Agricultural statistics are under his control, and he superintends the agricultural and veterinary instruction afforded by the several colleges and schools, with the model and experimental farms appertaining thereto. He also provides help and assistance to rural industry, probably meaning donations or rewards for good husbandry, and experiments on seeds, roots, &c., but in what way, or whether I am quite right in my apprehension of the meaning of this help, &c., I cannot say. The supply of corn and the state of the markets, in relation to that supply for consumption by the total population of the empire, are also under his supervision, as well as the drainage of the marshes and land generally. In his department likewise are placed the management of the imperial highways, and what we should call the cross or parish roads. There are two descriptions of agricultural schools: 1st. Farm schools, where children of labourers are received without charge, performing all the labour on the farm, and receiving, as a remuneration therefore, instruction in agriculture essentially practical; they are established in most of the Departments of the Empire, and have experimental farms attached. 2nd. Regional Schools: These have three objects, 1. To form enlightened agriculturists, by teaching them the principles of agriculture. 2. To offer an example or model of practical agriculture of a high and advancing order. 3. To make experiments for improving the cultivation of the soil. There were three schools appertaining to this class in 1863, the one at Grignon being the chief. The state furnishes several scholarships to these schools. Then there is the National Agronomic Institute, where instruction of a higher grade still is given to wealthy proprietors, having attached to it three farms, a garden, and a forest, containing altogether about 3,452 acres.* It is somewhat singular with so fine a climate, and with such favourable soil, the growth of wheat, and corn generally, should be so far below our own in productive amount; and in the quantity and quality of cattle and sheep, France is confessedly below the average of this kingdom. This, I am aware, has been attributed to the fact of the existence of a Minister and Government Department of Agriculture; but I think we may with more reason attribute such defalcation in corn and cattle to the great drain upon the population of late years, and even very recently, to fill the ranks of a large standing army and of detached corps for foreign service; the minute subdivision of land, and the general absence of sufficient capital in the hands of the cultivators of the soil, who are also, to a great extent, the owners of it. It would seem, however, that under the advantage of a few years of comparative rest and quiet, agriculture is on the increase. 1st. The growth of teasels for the dressing of cloth is increasing, they becoming an important article of commerce with foreign nations (I believe we do not use them now in England to any great extent). 2ndly. Madder for dyeing. 3rdly. The growth of tobacco is rapidly increasing, although carried on under great difficulties, owing to the Government monopoly of that plant. 4thly. Cattle have considerably increased of late years, also poultry and eggs. In 1864, I read that England imported 277,000,000 of eggs, of which three-fourths came from France, over 200,000,000. And finally, wine is on the increase: about 9,000,000 of acres are under wine culture. On the whole, I see nothing here to warrant the idea that a Goverment Department of Agriculture, although mixed with other interests, but putting agriculture foremost, has a damaging effect.

America.—In turning to what may be called a Democratic Government as compared with those we have been considering, I feel quite overwhelmed with the magnitude of the consideration given to the Agricultural Department of their Government by the Americans. That department is under a commissioner, who reports to the President yearly. Under the commissioner, and reporting to him, are a superintendent of gardens, superintendent of experimental farms, an entomologist, a chemist, and a statistician. I have here, replete with salient points for observation, the annual report of the commissioner for 1865, embracing all the subsidiary reports, valuable papers, and tables of statistics. It was forwarded to my kind friend Dr. Voelcker from the commissioner, and to the former I am indebted for its perusal; but time will not permit me to do more than briefly to allude, as I have done, to its principal contents, viz., the reports of the officials before mentioned. Is is, however, refreshing to hear a member of a Government Department of Agriculture speak thus: "The manufacturing facilities of the South are scarcely to be surpassed anywhere. Already it is understood that this interest, *next to Agriculture*, is to become the most important in that section, &c." And "I shall therefore cheerfully put forth my exertions in aid of measures of reconciliation" (alluding to the late war) "and for the advancement of the interests of Agriculture throughout the whole country, believing that branch of industry to be the foundation of the prosperity of *all* nations, and *the fostering of its interests by the Government* to be absolutely essential to such prosperity. History furnishes abundant illustrations of this truth." In many of the States agricultural colleges with farms attached are established, in connection with the Department of Agriculture, and appear to be in a most flourishing condition; although I must admit that, owing to the difference of the constitution of society here, similar results would not be likely to follow. Still, without wishing to raise that vexed question of Cirencester, something more might be done in this country towards the agricultural education of the youth of the middle classes destined to follow agricultural pursuits. Independently of the annual report, the Commissioner of Agriculture issues monthly (sometimes, it appears, bi-monthly) reports, thus keeping the whole country *au courant* with what is going on in farming matters at the time of issue; state of the crops; and such statistics as may then be procurable, not only in America, but in Europe. Among the tables in the Report for November and December last, are an exhibit of "The Farm Stock of Switzerland," "Statistics of Rinderpest in Great Britain," "Recent Export of Cereals to Great Britain and Ireland since September 1st, 1866," "Agricultural Products and Manufactures imported into Great Britain for the first nine months of 1865 and 1866," &c. The Consuls appear to take every pains to report any matter which may be thought to be useful to the Agricultural Department, and which may come under their cognizance, in the vicinity of their several consulates: this they seem to do, quite as much as a labour of love, as the mere fulfilment of duty. Every American I have had occasion to converse with, in the course of my inquiries, speaks of the Agricultural as one of the best Departments, if not the best, of the United States Government; and although I am aware that an American is not likely to dole out "small beer," as to any national institution, to an *in*quiring str*an*ger; yet, from all I can learn, I believe he is fully justified in his favourable view of the agricultural department of the United States. Now, surely, if all the countries I have mentioned—and, I believe, every European State besides—find a government department of agriculture desirable, we cannot contend that it is not so here, in England? I think my precedents, or examples, fully show that it *is*—modified, probably, to suit the difference of national habits and prejudices; otherwise, we may consider ourselves, in this matter, the only wise people in the world. But let us take the subject on its own merits, without reference to what has been done here, or what is doing in other countries. In the course of my inquiries, I have often been met with this observation: "Surely, Mr. Nockolds, the day for bounties and protection is gone by?" To this I answer, "Yes." But "the desirability of a Board of Agriculture as a Government department" does not depend upon such matters at all. You have released the infant from its swaddling clothes—you have cut its leading-strings; but, while he is enjoying his liberty, why do you persist in punching his head? Is it not probable that if agriculture were fairly represented in the Government, and not by a section of the Board of Trade, several Acts of Parliament lately passed, and which have been alluded to by Mr. Read and others in this room as unduly pressing upon the tenant-farmer, might have been modified? Look at the police-rate in rural districts; but, in the neighbourhood of market-towns, half the year a farm has nothing to be watched beyond the sheepfold, the homestead, and cattle yards; and the other half of the year, in some districts, one-fourth is bare fallow; yet the land pays in the same ratio for protection as a house and (say) a silversmith's shop, which is as productive one part of the year as another, and knows no fallow season. The injustice of such a system has been fully recognized in the Towns' Local Government and some other Acts (I believe) relating to assessments, for intermixed urban and rural districts; but nothing has been done to repair the injustice (as I believe it to be) of the Police Act. The blow has been struck, and the bump remains. A Board of Agriculture, with its president seated in the Commons, should at all times, when legislative enactments are proposed likely to affect the agricultural interest, examine into the provisions of the proposed measures, to see that impartial justice be done with regard to that interest. It should be enabled to act at once, without loss of time, in such matters as the cattle-plague, and without the lengthened ceremony of instituting a commission, and consulting hosts of advisers, including Messrs. Stamp-it-out and Knock-'em-down of this Club. Who can doubt that if, upwards of a century ago, when a former visitation of rinderpest took place, a Government department had existed, it would have left valuable documents and precedents in its archives—that is, if they had not been sent to the Tower—which would have been most beneficial to us at this time? The questions of sewerage and water supply cannot long remain in the state they are in at present. They are matters vitally affecting both landowner and land-occupier, and deserve, while they are being discussed, the serious attention of some person of ability and influence on behalf of the landed interest. It would be so in America. A member of the Dorchester Farmers' Club, in an able paper quoted in the "Farmer's Magazine," grounds all his arguments in favour of a Board of Agriculture upon statistics and their collection. Now, without denying for a moment the vast importance of statistical matters, I would ask, if the Board of Trade adopted his view of the proper method of tabulating and collecting agricultural statistics, it would not be equally effective as if that institution were called a Board of Agriculture? In fact, there is no virtue in a mere name; and to say that agriculturists place but little confidence in the Board of Trade simply because it is so called (there can be no other reason, presuming its machinery to work correctly), is somewhat puerile. What I mean is this: Supposing the present Government to grant a Board of Agriculture, they would simply transfer the present statistical department to the new board, with all its shortcomings and erroneous arrangement. It appears to me that the objections to the present mode of obtaining the returns of corn may be divided into two heads—first, that the off-corn, or lower qualities left after dressing up, with damaged samples, used generally at home by the grower, do not get tabulated and accounted for; secondly, that much of the corn sold does not find its way into the returns, and that, therefore, the average prices which regulate the tithe rent-charge, and in some instances rents also, are incorrect and, in the main, too high. Now, I am not quite clear that it ever was intended that off-corn should come into the averages—in some instances, at all events. In an Act of Parliament, passed 1809, for inclosing the parish of Chatteris in the Isle of Ely, the tithes of the old inclosed lands were commuted into corn-rents, to be fixed every seventh year at the option of either the payer or the receiver, according to the average price of wheat per bushel in Wisbech market; and the words used to denote the description or quality of wheat are "good *marketable* wheat;" but, most decidedly, all corn sold at market or privately ought, if possible, to be included; and it certainly does appear strange that the Government are diminishing the area or basis of the returns, by withdrawing considerable markets from the operation of the measure. Admitting as I do most fully great injustice here, I cannot but say that I do not see a possibility of getting anything like correct returns and estimates of corn used at home by the grower. Then as to the vexed question of farmers filling up the schedules of returns of quantities and varieties of crops: if they are averse to do so, I think, with Sir John Sinclair, that they ought not to be compelled; but then, on the other hand, they cannot with any good grace complain of the Government returns; and if the Government are to produce correct returns otherwise, they must go to a very large expense to do so, and introduce a system of inquiry and espionage, which would be too galling to be borne. I cannot see why the occupiers (say) of a union district could not apportion that union into (say) four sub-districts, and appoint one of their number (first furnishing him with a schedule of their crops and quantities) to go round at the edge of harvest and estimate the yield. The returns could be first made in sub-districts to the clerk of the Union, who would transmit the whole in one return. All individuality would thus be lost, if to lose it be a matter of so much moment, and all particulars would be deposited in the breast of the valuer—himself an occupier. I do not see that any other schedules, or at all events any more in number, would be required; and I think a sum of 10 guineas to each valuer for two or three mornings' ride would not amount to such a cost as to be onerous to a great country like this. However, I have not given the subject much thought, and my scheme may be impracticable. Still, the fact remains that our Corn Returns are very faulty, and should be amended in some way. I am happy to hear from the statistical authorities that the objection of occupiers to give their own returns is fast disappearing, and that in Scotland and much of the North of England they readily furnish them. I may add that the actual sales of corn in the markets as returned at the end of the year would, when compared with the estimated quantity, give some idea of the quantity and value of that consumed at home, and not brought to market. To be of much use, the quantity of corn on the land at the edge of harvest ought to be ascertained as nearly as possible. But a Government department of agriculture is required for other matters besides statistics. Admitting their great value in this, as well as many other matters, I yet think that their use is pushed to the utmost in this utilitarian age, and that they act as a great check to comprehensive thought and deep reasoning. You can scarcely mention the name of any town or place in conversation, but you are immediately assailed by some one wishing to know how many inhabitants there are, what are the principal manufactures, what the percentage of females compared to males, if there are three hats between five boys at the National School, and whether the girls of the same establishment have blue or pink ribands in their caps. Statistics are carried even into sacred matters: the power of the Creator is measured by the integral or differential calculus, and salvation is subjected to the doctrine of chances. I fancy figures are often the resort of a shallow reasoner, and the presumed impregnable fortress of a barren brain.* To quote poor Hood, statisticians are—

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* Extracted from the American Agricultural Report for 1865. Article: "Agricultural Colleges," by Henry F. French, President of the Massachusetts Agricultural College.

> "A notable set of Paul Prys,
> By courtesy called "statistical fellows."
> A prying, spying, inquisitive clan,
> Who, after groping in pot or pan,
> Have ascertained that a labouring man
> Wears a pair-and-a-quarter of average breeches."

But what is the annual value of that interest for which I say a Board is desirable? Such, as alone, in my opinion, justifies its establishment. In the *Farmers' Magazine* (I got it second-hand from the *Pontefract Telegraph* of 26th January last, and cannot tell the date of the original publication) appeared an article which thus quotes from a speech of Mr. Bright's: "If in England the tenantry, and in Scotland the tenant farmers, the most capable, the most intelligent, the best agriculturists perhaps in the world, if they were to join in favour of measures, such as measures hostile to the game laws, hostile to any injustice which is supposed to exist with regard to the improvement of tenants, it would be quite impossible for the Parliament to resist their demands." I wish I could make him prove his words. The writer then goes on to make some calculations (which I confess perfectly astounded me) on what he says are the last statistics. I can read all his figures to you if you wish it, but I think the sum total is all we need look at. He makes the value of the live and dead farming stock of this kingdom, based on those statistics, amount to the enormous sum of 400 millions. Now, although I demur to some of his prices of stock, and find that his quantities of corn grown do not agree, so far as I can make out, with the Board of Trade returns for 1866, just published, yet I can see by the latter that he is not very wide of the mark. The total earnings of every other class in the United Kingdom amount to 418 millions, inclusive of the payments to agricultural labourers of 75 millions. Surely the owners of this extraordinary amount of property are entitled to some consideration, and to the poor compliment of having a Board of Trade *and Agriculture* at all events. But I must add my firm belief that this large amount of capital pays a much lower interest per cent. than capital invested in any other legitimate way. Why are we to be slighted in this absence of all acknowledgement by our Government? Are we less loyal, less moral, less industrious than other classes? Do *we* parade our grievances in the public thoroughfares, to the hindrance of traffic, to the alarm of the quiet and orderly disposed, and to the great detriment of trade? Are we less disposed to public or private charity, according to our means, and in particular those cases of manufacturing distress which of late have visited this kingdom? Do we succour with pecuniary support and other means those operatives who may in any branch of trade be "out on strike" without making any attempt to heal the breach between master and man? I trow not. I trust I may be considered now to have made out a claim for a "Board of Agriculture as a Government department," and that I have to a certain extent shown the desirability of it. I will here take the opportunity of saying that I am somewhat puzzled as to the statistics of the number of persons tabulated as agriculturists. Mr. Dent, M.P., in the Royal Agricultural Society's Journal (I have omitted to note the number and date) makes them amount in Great Britain to, in round numbers, 2,302,000, and the Board of Trade returns make the total population 23,128,000; therefore about one-tenth only of these are engaged in agriculture. Making allowance for the fact that the sum before mentioned (400 millions) is the value of the farming stock and produce of the United Kingdom (exceeding of course Great Britain), it still appears somewhat startling that so small a portion of the population should possess such enormous wealth as still remains. Perhaps some gentleman can set me right about this. I shall now broach a scheme for a Government department which may perhaps seem a little startling at first, I would have a Board of Agriculture and Public Health, whose president or head should have a seat in the Cabinet. The supply of food, both vegetable and animal, must of necessity be intimately affected by the wellbeing of agriculture; and the supply and quality of both kinds of food, together with the supply of water, will also as intimately affect the public health. Again, those conditions of the atmosphere which result from imperfect drainage and disposal of sewage and other noxious matters, producing zymotic diseases, injure, though perhaps not in exactly the same form, both man and beast. This board would therefore have under its control agricultural statistics and all matters relating to land; the supply of water to, and the effectual drainage of, the kingdom generally; and all measures for preserving the public health. And now a word or two on unity of action. To me it is a source of gratification to see some little stir in the agricultural world, in forming societies for protection against encroachment and injury to, and for promoting the well-being of, the agricultural interest, by whatever names those societies may be called—Chambers of Agriculture or Farmers' Clubs. In my opinion, one should be formed in the neighbourhood of every considerable market-town. I would suggest that the members should possess themselves, in some way, of a comfortable room, in each town, where they should meet, on some plea or another, such as discussions on subjects connected with husbandry, or the political position of the agricultural interest, say some four times a year. Lectures might be given, or something done to cause interchange of courtesies and sentiments, and a better knowledge of each other among the agriculturists of the neighbourhood; and if nothing better can be found as a cause for meeting, give the girls a dance. The room would be found useful, on a market-day, as a place where parcels might be sent by the different tradesmen of whom the members of the club or chamber have made their usual weekly purchases; and thus Mr. Smith's coffee would not, as is now often the case, get put into Mr. Jones's "pheaton," as the ostler calls it; nor Mr. Jones's sugar find its way into Mr. Smith's "chay." Such a room would also be useful for the female members of a family, who may have accompanied its head to the town for the purpose of shopping, to meet him at, after the business had been got through. I would in no wise interfere with the usual market ordinaries. Many of the innkeepers hold farms or lands themselves, and are often staunch friends of the agricultural interest. But I must remind you that such societies should not be without funds. Open your purses a little wider than you at present seem inclined to do. The annual expense of the room I have mentioned would be but trifling. An elderly female could keep it clean, and attend on market-day, and at other times when required; but each society should possess a tolerably round balance at its banker's, and for the following reasons: As a head and front to all these societies, I recommend the appointment of a Tribunal of Agriculture, to consist of some twenty members, to be chosen from the most eminent practical men among the members of the Agricultural Chambers and Farmers' Clubs. This Tribunal should have a paid secretary, who should be well versed in Parliamentary forms, usages, and tactics. In fact, he should be something of a Parliamentary agent. We will suppose that there are four ordinary quarterly meetings annually. The secretary should watch all notices given for bringing any bills into Parliament likely to affect the agricultural interest, and if he, in consequence, thought it necessary to call a special meeting of the Tribunal, he should be empowered to do so, and then notice of the matter requiring consideration and action, should be sent to the country societies, which, in return, should send to the Tribunal the result of their discussions and the general opinion at which they have arrived. They should also all contribute their quota to the legitimate expenses of the Tribunal, which would not, however, be very great, beyond the secretary's salary. Thus advised, the tribunal would itself discuss the opinions and conclusions elicited by the reference to the country societies, and take such measures as might seem applicable to the matter. If we never get an Agricultural Board, there must be, at all times, some department or other of the Government which would be accessible to even an agricultural application for a hearing, and to it would the Tribunal appeal, as representing the feelings and opinions of the united agricultural interest of the kingdom at large; thus, a force and a weight would be given to those feelings and opinions which at present they do not possess. How stands the matter now? The president of the "Wool-clip cum Muttonbone" Farmers' Club seeks an interview with the Clerk to the Privy Council, President of the Board of Trade, or some other Government official, on some crotchet of the club's, say, respecting the ovis variola—small pox in sheep. He is received with courtesy—heard with attention—and is assured of the gravest consideration of the matter by the ruling powers. Well, and what comes of it? Why, as they say in the Eastern Counties, "Northin." Or a deputation from the Chamber of Agriculture of "St. Stickfast in the Clays" waits upon the Chancellor of the Exchequer on some financial matters, and if the members are not struck speechless by the splendour of those rooms in Downing-street, nor embarrassed by the luxurious softness of the sofas, ottomans, and settees contained therein, they put before that high authority tolerably fair arguments in support of the views they entertain of the question at issue. They are here again received with courtesy, heard with attention, and are assured of sympathy, but are pleasantly reminded that they lost an opportunity of getting half the hog some years since, which might not occur again; and had they acted diffe-rently, there would not have been any necessity, in all probability, for their assembling before him on the present occasion; an undercurrent of expression, if I may so term it, seeming at this time to steal over the official countenance, which, if it found vocal utterance, would in all probability be enunciated in the word "Gammon." Well, and what comes of all this? Why, as they say in the North of England, "Nowt." No, these spasmodic and intermittent efforts, emanating from small sections of what would, if united, be unquestionably a very numerous and powerful body, are useless. What is required is a well organised and persistent movement for the protection and defence of that interest, which, it does appear to me, is more open to encroachment and unfair dealing, and is more encroached upon and more unfairly dealt with, than any other in the British Empire. While saying this I disclaim all intention of embodiment for offensive action against any other interest, or any class of men whatever.

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* The Editor of the *Pall Mall Gazette* complained a few days since that men of good education, talents, and attainments were often *slovenly* thinkers; and, no doubt, they will be, if they can hazard no speculative idea, nor wander a yard from arithmetical formula.

Sir **George Jenkinson** said he was exceedingly anxious, as a member of that Club, to offer his thanks to the gentleman who had read such an able paper on this important subject, and to support the object of it (cheers). He was the more desirous of saying a few words because that gentleman had dealt rather hardly with his (Sir G. Jenkinson's) ancestor for having consigned certain documents to the Tower. If he might make a suggestion on that point, it would be that probably they were so consigned for safe custody (laughter); and he would add that, however much his ancestor might have incurred the wrath of Mr. Nockold, by his conduct in that respect, he, his descendant, was fully impressed with the importance of carrying out the main suggestion which had just been made (Hear, hear). It was now some years since he advocated, at a farmers' meeting, the establishment of a Government office, and the appointment of a Minister of Agriculture. He thought that such a department of the Government would do good service; and he hoped that before long they would see it established. There could be no doubt that of all departments of the State, agriculture was the most important, and had the first claim to attention. The prosperity of almost every other department concerned mainly that department itself; but the prosperity of agriculture concerned the multitude, who, without agriculture, could not obtain their supply of food. If the merchant were to give up trade, somehow or other, articles of m e chandize in which he had dealt would still be supplied; but that was not the case as regarded food; and the chief care of the Government ought to be bestowed on that upon which the mass of society was dependent for support. There were many subjects of great importance with which a Board of Agriculture might fitly occupy itself: among these, was the collection of agricultural statistics. He could not but think that the difficulty of individuality was one which ought not to be allowed to weigh with farmers in giving returns. He must say it appeared to him that the farmer who was anxious to conceal the amount of produce obtained on his farm did not look so much to the advancement of the general good as he ought to do. Moreover, it was vain to attempt to conceal what was grown on a farm If any land-agent in the neighbourhood were anxious to pry into the produce of farms, nothing could be easier than for him to ride about an entire parish, take notes, and give the results to anyone who felt interested in the matter. He did not think any farmer need, in that point of view, fear corn returns, as, when the returns reached the department in London, they would have entirely lost their individuality. It would be perfectly easy for the department to summarize all the returns, taking each county, each union, and each parish separately, without any man's name or farm in any way appearing; and he believed it would be very advantageous to the community if such returns were made, and that there was no real foundation for the objection to which he had alluded. There were other matters of great importance which might be usefully dealt with by a Board of Agriculture—the importation of cattle, the prevention and cure of diseases, and various other things of a kindred character, which were more suitable for the department of Agriculture than for the Board of Trade, whose duties were more particularly connected with various branches of commerce. The whole subject was one of deep interest; and he trusted that something more tangible would result from its introduction than a discussion. Indeed, he should be glad if, on that occasion, the Club would depart from its rule of not passing resolutions, and, like the Dorchester Farmers' Club, adopt a memorial, setting forth its strong wish for the establishment of a Board of Agriculture (cheers).

Mr. S. **Sidney** (Islington) thought it would be well for them to consider, before pressing their claims to a Board of Agriculture, what they were likely to get by it if they had one. It was necessary to consider what sort of people were likely to form such a board. They had now had a great many years' experience in such matters; they had returned a great many members to Parliament; they had had noble lords representing agriculture in cabinets, and they knew what had been done for them (laughter). They had had some noble dukes to lead them on, in public and in private meetings, and to raise their expectations, and they knew what had been the result (Hear, hear). Some idea of what was to be got by a Board of Agriculture might be obtained from the fact that a well-known member of Parliament had taught farmers that they might make their fortunes by growing potatoes (laughter). He had seen simple gentlemen grow into peers, and peers' sons grow into dukes, but he did not remember any particular thing that they ever did for agriculture. From Mr. Nockolds's interesting paper they learnt that a great deal of attention was paid in foreign countries to agricultural education. He did not know what there was to prevent those who wished to give agricultural education to their sons from doing so to any extent; but if there was any one thing against which tenant farmers entertained a strong prejudice, it was the being taught by other people how to carry on their own business (Hear, hear, and laughter). Mr. Nockolds told them that if there were a Board of Agriculture agricultural statistics would be collected. Although he did not believe that agricultural statistics would produce such wonderful effects as some statistical people seemed to suppose, he did not doubt that they would be of some use. But why had they not agricultural statistics? Because tenant farmers as a body were much opposed to their collection (Hear, hear). They had only got to say the word, and to-morrow there would be a most complete set of agricultural statistics prepared and placed before the public (Hear, hear). The former Board of Agriculture was dissolved because tenant farmers thought that continued inquiries led to taxation (Hear, hear). They had an illustration in the Board of Trade of what a Board of Agriculture was likely to be. On that Board there was a president and there was a vice-president; but though that board might have been an advantage to the nation, traders could tell them, if questioned on the subject, that as regarded them the only effect had been to impose vexatious restrictions and fetters. If farmers would like to have more restrictions imposed on them, if they would like to have it laid down that no person was to hold any appointment connected with the land unless he had passed an examination, then perhaps the sooner there was a Board of Agriculture the better (laughter). And then, what kind of persons were likely to represent a Board of Agriculture? Mr. Nockolds said he would like the chief representative to be in the House of Commons; but let them not expect anything of the kind. They might depend upon it that as the department would be a minor one a duke would be at the head of it (laughter). He had no objection to dukes as such; on the contrary, he believed that they held a most useful place in society, and dukes of the best description were very pleasant landlords. Besides the duke there would, of course, be an aristocratic secretary, who, though a very clever man, would in representing the Board of Agriculture probably show pretty clearly that he was exceedingly disgusted with everything connected with agriculture, except his salary (laughter). No doubt deputations would have to go to the Board of Agriculture. They all knew what a deputation meant. A number of gentlemen assembled at the Salisbury Hotel; some of them had a new hat, some new boots, and others went to the expense of a complete new suit (great laughter), and two or three had prepared speeches which they expected would make the minister shake in his shoes. Well, the gentlemen had, he would suppose, an appointment with the new Minister of Agriculture. When they got to the office they found that, owing to the holding of a Cabinet Council, or some other important business, the duke was not there, and they could only meet the secretary. Well, they all walked in. He thought he saw them then, "with my mind's eye, Horatio!" (much laughter). They went into the room very boldly. There stood the secretary, with a perpetual sneer on his fine aristocratic countenance, perhaps chewing a toothpick (laughter), with one hand in his breeches-pocket, while in the other he held the sporting newspaper which he had just been reading; and, uncommonly annoyed at having been thus interrupted, feeling, no doubt, what a bore it was. When the chief speaker began, he contrived to say something which made him forget what he had intended to say; and he consoled himself for his annoyance by making remarks which, though they might be quite true, were very unpleasant (renewed laughter). The result was that, having gone in like lions, the deputation came out like lambs (laughter), and there was the end of the interview with the Agricultural Board (continued laughter). Mr. Nockolds had told them that other countries—Prussia, France, and America—had Boards of Agriculture. That was true; but they had one thing which foreigners had not—they had an institution called the House of Commons, which they might make use of if they pleased for the benefit of agriculture (Hear, hear). Farmers had the power of returning members who would really represent their interests; and, if they did not choose to do that, it was they who were to blame (Hear, hear). Instead of that they often returned the eldest son of a great landowner simply because he was his eldest son. He did not mean to say that on the whole the agricultural interest was much ill-used in Parliament; but farmers were not like Beales and Co., who complained that they had no votes; they had votes, and might return those who would really look after their interests; and if they did that there would be no need of a Board of Agriculture (Hear, hear).

Mr. S. Skelton (Sutton Bridge, Wisbech,) said he was very much struck with the able and effective manner in which Mr. Nockolds introduced the subject—a subject of great importance to the general welfare of agriculture and of all connected with the land. His object, however, in rising was to offer a word of comment on the amusing and droll speech to which they had just listened. He could not conceive how Mr. Sidney could by that speech have added one iota to the good results which might arise from a discussion of that kind (Hear, hear). His great aim seemed to have been to decry all efforts on behalf of agriculture, to censure all parties interested in it, and to show up everybody whom he happened to think of (laughter). He repeated that he did not see how any good was to arise from such an exercise of the talent for fun possessed by Mr. Sidney, and he hoped those who were about to speak would recal their minds from such jocularity to the important questions at issue.

Mr. W. Crosskill (Beverley), while admitting that great credit was due to the introducer of the subject, had hoped that he would show them what pecuniary advantages they were likely to gain by the establishment of a Board of Agriculture; in other words, how it would put money into the pockets of farmers. Mr. Sidney's speech, though it had been complained of as being too funny, contained some things worthy of their attention. He agreed with Mr. Sidney that the county members should be practical men, and should unite together more in reference to questions of special interest to farmers. For example, a vast amount of money might be saved in highway and county rates, as for instance by a more general adoption of the recent Highway Acts. The appointment of a Minister and Department of Agriculture would involve considerable expense, and he hoped those who followed, knowing, perhaps, more about such matters than he did, would show how it would benefit farmers in a pecuniary point of view.

Mr. C. S. Read, M.P., said he had not intended to take any part in that discussion, his object coming there being to learn the opinion of others, and, if desirable, to act upon it; but, having been called upon to speak, he would proceed to say a few words. In the first place he would tell Mr. Sidney that the Government already did all that he mentioned; but then they did it so badly that they would like to try and have it done better (Hear, hear). The divisions of subjects connected with agriculture were separated at present into so many different branches or departments, that when anyone wished to ask a question of the Government, he did not know whom to apply to or where to go (Hear, hear). They had been asked what good a Board of Agriculture would do. Was there, it was inquired, any employment for such a Board? He really thought there was. He would not say that they wanted a special Board; his own opinion had been for some time that what they required was a separate Department of the Board of Trade allotted to agriculture, They wanted, he thought, a Department with a permanent Secretary, who might be a clever man and a very useful one, and, at the same time, be descended from an ancient family (Hear, hear). In foreign countries the Government did everything and the public nothing; in our own country, on the contrary, the public did everything and the Government next to nothing, except take their money; and he thought they might reasonably hope that benefit would arise from the establishment of a department of the Board of Trade, which would understand the wants of agriculturists and assist them when they were in a little difficulty. He apprehended that such a board would, as a matter of course, attend to the collection of agricultural statistics; that it would also take cognisance of the transport of cattle, especially the internal transport, the holding of fairs and markets, corn averages, and the outbreak of any disease among cattle or sheep. Mr. Nockolds had remarked that the Minister of Agriculture might also be a Minister of Health. That was in accordance with something that passed in a conversation in which he (Mr. Read) took part at the Privy Council Office. He must confess, that at first he could not see what health had to do with agriculture, unless it was that farming was a healthy occupation; but after what Mr. Nockolds had said he thought it desirable that the two departments might be united (Hear, hear). He had no wish to follow Mr. Nockold's remarks with regard to agricultural statistics; but he must say he thought that before they attempted to collect the estimated yield they must be better judges than they proved to be with regard to the last harvest (laughter). As to the corn averages, in speaking of the evils inflicted on the grower by the present means of taking the averages, the introducer omitted to remark that the small dealers went about the country to different markets buying corn, that this corn was afterwards bought by a large dealer, and that it then came to London, so that by the time the last return was made there were three profits and three expenses of carriage added to the original price paid to the farmer. His (Mr. Read's) idea was, that no corn should be returned unless it were bought direct from the grower. In conclusion, he would remark that he believed that if all that had been done or attempted to be done were placed under one department, the agricultural community would be much benefited, so that in the end something good would come out of that evening's discussion (cheers).

Mr. J. Nash (Reed Court, Rochester) quite agreed with Mr. Read that something might be done, but disagreed with him in thinking that it would be done through the Government. As to the corn averages, they all knew the system to be a perfect failure; there was not one word of truth in them. The Government were misled; and he, for one, would say that if these papers came to him he would never fill one of them up (laughter). He did not think any one had a right to come upon his farm to ascertain what he grew, and so shape the prices as to induce others to sell corn at less than they ought to do. He had had enough of it (laughter). During 30 years' experience he had had an inquisitorial fellow coming to his farm—the exciseman (renewed laughter). He had come to him, and said, " How many hops do you grow ?" He had to tell him by being obliged to allow him to weigh them. What had been the result? Why, a depreciation in the prices of his crops; and he believed there would be a depreciation in the prices of wheat, or of any other grain, whenever the produce was ascertained. Now we have got rid of the exciseman supply and demand regulate the prices. He had always advocated free trade, and he did not like any one's coming to look at his crops without being invited. He could not admit that the Government had, or any one else had, a greater right to come there for such a purpose than he had to demand how many persons dined in that house every day. He would not submit to such a system unless he was obliged. Of course, if the law compelled it he would have no option in the matter. On this subject he spoke strongly, because he felt strongly. When he said that he had paid £1,375 for duty alone on account of 100 acres of land, he would leave them to guess whether he did not feel keenly (" Question"). He was sorry that he was considered to have wandered from the question on the card. One question, however, for consideration was whether they should allow persons to take these returns, or whether a department should be formed which would have the power of doing so; and he, for one, protested against any Government interference with respect to their crops, being fully convinced that no benefit would arise to the farmer.

Mr. Albert Pell (Hazelbeach, Northampton) said although he could add but little to what had been said on that subject, he could not remain entirely silent. In the first place he must express his obligations to Mr. Nockolds for the interesting, amusing, and intelligent manner in which he had introduced the subject. That gentleman had acted as a sort of Peter Parley in relation to foreign countries, and had presented the topic under a very picturesque aspect. One point which struck his friend Mr. Read had also occurred to himself—namely, the connection between a Board of Agriculture and a Board of Health. A person of considerable authority had remarked that if they obtained a Board of Agriculture they must submit to a Minstry of Health. He did not know what was meant by submitting to a Ministry of Health; but there seemed to have been an idea abroad that the two branches should be connected together; and he could well conceive that a Minister of Health, a sort of Sir John Thwaites in the country, might, to a certain extent, be a useful person. It was becoming a serious question in the case of many large villages how to deal best with the nuisances connected with the dwellings of the rural population. Cottages were built without any reference to the conditions of health, and there was at present no authority designed to deal effectually with such matters. They might indict the poor man who put up with such nuisances; they might quarrel with their neighbours about the best means of getting rid of the sewage; they might appeal to the Quarter Sessions in particular cases; but, after all, existing arrangements were in a very lose condition, and he thought if such an office or establishment as a Board of Agriculture were established, it might be well to add to it something analogous to the office of the Metropolitan Board of Works, some organisation that would take cognizance of dwellings in rural villages, and require new buildings to be erected in accordance with those sanitary rules, without which, as they all knew, persons could not live together in health and security. Mention had been made that evening, perhaps rather too pointedly to agricultural statistics. He himself had a difficulty in seeing what good could be derived from annual statistics—at least as they were at present collected. He thought, however, it would be extremely interesting to know—say decennially, when the census was taken—how far the character of farming in England was altered; whether they were becoming more a grass-growing people or a corn-growing people: but he did not see the use of constantly spending a large amount of public money to gratify curiosity. He was English enough to prefer seeing a good iron-plated vessel built with the money, and he thought that would be better for the interests of the nation. It was important to know, and he thought their manufacturing brethren had a right to know by means of returns made every tenth year, that the best use was made of the land, and what amount of stock, live or dead, was to be found upon it. The duty of affording such information might be connected with the Board of Agriculture; but he did not see what immediate good was to result from it. Perhaps in a few years he might be led to a different conclusion.

Mr. J. A. Clarke (Long Sutton, Lincolnshire), said he had lately seen a letter from the Secretary of Sir Stafford Northcote, stating that at present the Government had no intention of devoting even a separate clerk to the business of agriculture. On the other hand, he had reason to believe that Sir George Grey was in favour of the appointment of a Minister of Agriculture. At a meeting of a farmer's club in the north of England Mr. Charles Rea related a conversation with Sir George Grey, in which the right hon. bart. set forth the advantages which he considered would be conferred by a Minister of Agriculture. He (Mr. Clarke) had no intention of making a speech, but thought it advisable that those two facts should be mentioned (Hear, hear).

The Rev. E. Smythies (Hathern Rectory, Loughborough) regretted that Mr. Sidney had treated the subject as a proper one for mirth (Hear, hear). Every one admitted the necessity of having some central point for agriculture, by means of which adequate pressure might in cases of necessity be brought to bear on the government of the day. The progress of agricultural opinion on this question was significantly proved by the formation of so many local Chambers of Agriculture, and the logical sequence of that was the appointment of a Board of Agriculture, which should take cognisance of matters of interest discussed in those chambers. As regarded statistics, he could not conceive that such sentiments of opposition as they had heard that evening represented the intelligence of the agricultural body in this country (Hear, hear). What was the hypothesis of the whole thing? Why, that the collections of agricultural statistics would be for the benefit of the agricultural interest. Let any one attempt to show that it would not be for its benefit, and that would be a fair and legitimate argument; but instead of that, the whole thing was pooh-poohed and ridiculed. The worst that could happen was that no result would be obtained; but he believed that great national benefit was likely to arise (Hear, hear). To whom had farmers to sell their produce? For the most part to dealers. These dealers were generally connected with Chambers of Commerce, and *they* took good care to collect the information that was required. They knew the probabilities as to the supplies from other countries, and they knew the probabilities as to market prices for several months to come. On such points farmers were not thus informed; on the contrary, they were utterly at sea. There were very few farmers who could tell in October or November what were the probable prices of wheat in the succeeding April, May, or June. That was a defect which would to a very large extent be supplied by the collection of agricultural statistics. At all events, such are the opinions of those who advocated it, and no one could say that it would not produce that result. In his opinion, the establishment of a system of collecting statistics would be very valuable to agriculture. As to such a system being inquisitorial or injurious to the interests of farmers he could not conceive how any man of sense could hold such an opinion. What was the meaning of "inquisitorial"? He did not care about anybody's knowing what he grew. Publicly, landlords were now in the habit of setting down the produce of farms at twice what it really amounted to (Hear, hear), and he had often thought that it would be well if many of them would cultivate a little of their own land, especially if they took into their own hands the fields adjoining their game coverts, in order that they might be able to form a more correct judgment. At present two many of them seemed to think that farmers made gold with every clod they turned, and one advantage perhaps of a system of statistics would be that it would tend to dispel that delusion (Hear, hear).

Mr. J. Bradshaw (Knole, Guildford) was surprised at some expressions which had fallen from different speakers that evening. Since he had been a member of that Club there had arisen many questions connected with agriculture which might have been beneficially treated if there had been a Board of Agriculture to appeal to. Agriculture was of the greatest importance, not only in this country, but throughout the world, being the mainstay of everything; and that being the case, it appeared to him to deserve the special attention of a separate Government department.

Mr. T. Duckham (Baysham Court, Ross) thought the truthful remarks of Mr. Read respecting the corn averages constituted a very strong argument in favour of establishing a Board of Agriculture. He (Mr. Duckham) had had some experience in that matter. A few years ago, when his own county was not provided with railway accommodation, and wheat was a low price, a friend of his in the district asked a large buyer in a distant market why he did not come to their town to buy corn. The reply was, "Why, what would be the use of my coming there, when all that I could buy would not suffice to pay my expenses?" He was, he said, led to that conclusion by seeing the corn averages. His friend, however, asked him to come and see what he could do. He did come, and the effect of his coming was to raise the price of corn 6d. per bushel. Some years afterwards the same lax state of things continuing, he (Mr. Duckham) went to the Board of Trade on the subject. He was there told that there was an office whose duty it was to make proper returns; but he replied that no return was made of the corn which passed from his market to two or three other markets, and that the cost of each transit, together with the factors' profits, were added to the original cost, without the low price it was originally sold at being taken into consideration. In a few days there came down an order that fines should be levied in all cases in which returns were not made; but that order remained unheeded, and ultimately the town and county was knocked off altogether. Had there been a Minister of Agriculture he might have looked into this matter, and the result might have been different. He (Mr. Duckham) wrote on the subject to the late Sir George Cornewall Lewis, when he was Chancellor of the Exchequer; but he only said he was aware of the constant evasion of the law, and that it was difficult to rectify it. As regarded agricultural statistics, he could not see what reason they could have to fear making a return of the acreage of the different kinds of crops which they grew (Hear, hear). At a recent meeting of the Dorchester Farmers' Club a gentleman had advocated the employment of appraisers to value the growing crops, and that the farmers should afterwards make a return of their yield. But such a course as this would, he felt, be highly objectionable, and one which no Englishman would like to submit to; and surely that gentleman must have been nodding when he spoke in that way. He (Mr. Duckham) thought there would be great advantage in knowing the acreage of planted corn during its growth. The probable results of the harvest were set forth in the *Mark Lane Express* by means of information obtained at considerable expense. He would add that in his opinion, had there been a Minister of Agriculture, when the cattle plague first broke out, many thousands of pounds would have been saved to this country (Hear, hear).

Mr. W. Gardner (Bekesbourne, Canterbury) thought that unless they obtained some information as to the probable exports of corn from foreign countries agricultural statistics would be rather detrimental than otherwise to farmers. They knew that corn merchants obtained special information of that kind. Statistics with regard to England would supply those merchants with what was a great desideratum with them; while, he repeated, it would not benefit agriculturists, but probably injure them, if they did not possess information in reference to the crops of other countries.

The CHAIRMAN, in summing up the discussion, said he agreed very much with the gentleman who had just sat down. He had long held the opinion that agricultural statistics would give the merchant a very great advantage over the farmer. Although the discussion had been a little irregular, in consequence, perhaps, of the subject being rather a political question than one connected with the details of agriculture, he hoped it would lead to beneficial results.

After a brief reply, on the motion of Mr. Read, M.P., seconded by Mr. T. Horley, a vote of thanks was given to Mr. Nockolds; and after the usual acknowledgment to the Chairman, the proceedings terminated.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

THE RELATIVE VALUE AND MANURIAL PROPERTIES OF PURCHASED FOOD.

On Tuesday evening, April 2nd, a lecture, being the first under the new arrangement fixing the lectures to the members for the first Tuesday in each month during the season, was delivered by Dr. Voelcker, in Hanover-square, on the above subject.

The chair was taken at eight o'clock by the president, Mr. H. Thompson, but the attendance was very small.

Dr. VOELCKER said: Mr. Chairman and gentlemen, in no other country is the art of feeding so well understood as in England. Foreigners on coming to this country are surprised when they look at its fat stock, and still more so when they are told in what an incredibly short time an English farmer is able to fatten his animals for the butcher. Now there are several reasons for the superior skill which distinguishes the British farmer in comparison with continental stock-feeders; and it may not be amiss if, by way of introduction to this subject, I ask you briefly to consider them. They are, indeed, well known to every one who has paid attention to the matter, and this makes it the more surprising that our continental neighbours seem to ignore some of the most rudimentary principles with which every stock-feeder in England is well acquainted. The first thing which is so much overlooked on the Continent is the proper selection of stock. The English farmer has learnt to appreciate the advantage of having well-bred animals to fatten, and therefore abstains from spending money upon coarse, ill-bred beasts, which do not fatten well upon any kind of food, and which, as the saying is, soon "eat their heads off." I need not allude to the superior breeds which are distinguished for their fattening qualities. These are well known to the English farmer, and, therefore, I pass on at once to make a brief allusion to a second reason why the English feeder of stock has such a decided advantage over his continental neighbours. The English farmer feeds his animals well, and endeavours to get them ready for the butcher in as short a time as possible. He has learnt that the sooner he can prepare them for the butcher, though he may spend more money in a given time, the better will it be in the end; and he is not satisfied with merely giving his stock an abundance of food, but is very careful in placing before his sheep, or his fattening oxen, or his pigs, such feeding mixtures as he has been taught by his own experience are most appropriate to the object in view. A third reason which may be mentioned for the superiority of the British over the continental stock-feeder lies in the fact that whilst in many parts of France, Germany, and Holland, and indeed throughout the Continent of Europe, animals are half-starved in their infancy, the British farmer supplies his young stock abundantly with cake and food which is usually called concentrated, or, to speak in chemical language, with nitrogenous food; nor does he cram young stock too much with chaff, innutritious grass, and similar bulky food, which on the continent is given too much, to the exclusion of more concentrated, nitrogenous food. I should not like to say a word in disparagement of straw as food. Straw is a most valuable food in its proper place; and, indeed, for fattening beasts which are abundantly supplied with oilcake, a certain amount of tender straw-chaff appears to be almost indispensable if hay-chaff is not at command. Young stock, however, should not be supplied with food which is so poor in nitrogenous matter, in fibre-producing substances, as straw is proved to be, and the English breeder of stock seems to have learnt this practical lesson from his own experience. But perhaps the main reason why the English farmer excels foreigners so much as a breeder and feeder of stock is that he is an eminently practical man—a man who by placing at different times all kinds of food, good, bad, and indifferent, before his animals, has learnt by dint of sheer experience what is best suited to them. On the continent, on the contrary, the science of nutrition has been much more studied than the art of feeding. Attention has been given but very scantily to practical feeding experiments such as have been conducted so carefully and successfully by Mr. Lawes, of Rothampsted. In preparing this lecture for to-night I have been led to look over our former *Journals*, and I have been surprised at the amount of really useful and permanently-valuable work which has during the last 20 years been performed by Mr. Lawes, at Rothampsted. The feeding experiments conducted there are quite unique, and perhaps those who do not now find as much useful information as they would like to derive from our *Journal* would do well to study some of the practical papers of Mr. Lawes in former volumes, more especially his paper on pigs, which is quite a model paper on experimental feeding. The art of feeding and fattening stock is a peculiarly practical one, and actual experience with different kinds of food, or mixtures of them, frequently teaches us much more than the most refined preconceived scientific experiments. In all experiments the experimenter is too apt to forget that what he has to deal with are not mere dead recsptacles upon which he has to make experiments, but living creatures, having a nervous system, peculiarities of habit, and an organism which must be considered at the very outset. The whole subject, however, of nutrition is, it cannot be denied, enveloped in considerable mystery; probably it will in a great measure remain so; and so long as we cannot clearly establish principles that will hold good in every instance, it would be unwise altogether to throw overboard the results of actual farming experience, and to fatten according to the prevailing theories of the day. Before proceeding further, perhaps I may be allowed to make one or two remarks on the two essentially different plans on which the process of nutrition are studied in England and on the continent. It may be instructive to examine the way in which on the continent physiologists and agricultural chemists endeavour to get a deeper insight into the chemistry of food, the powers of animals to assimilate flesh and fat, and so on. On the continent, agricultural chemists and physiologists in studying the process of nutrition proceed by putting up animals to just enough food to keep them at their live weight. They experiment with different kinds of food, arranging the weights of the food according to its composition, in such a manner that they obtain in every particular instance what they conceive is sufficient to keep them at the same weight, and from the results of the weighings they derive general deductions, according to which they estimate the value of the food. In England, on the contrary, the plan is that of putting, even in accurate feeding experiments, before the animals an abundance of food of difference kinds, to let them choose from this variety of food what they will take, to ascertain afterwards what has been taken up in the animal organism, and how much has passed into excrementitious matter; and then deducting the matters which remained undigested, or have been altered in various ways in their passage through the animal, from the total amount of food, the English experimentalist seeks to arrive at some conclusion as to the value of the food which English farmers are in the habit of giving to cattle.

Now, this latter plan appears to me by far the more rational mode of procedure. The chemistry of food is, as I have already intimated, a subject which has engaged the attention of many scientific men. The literature of the subject is very extensive; and to men of the highest order, as chemists and physiologists, including Busanco, Liebig, Bishop, and Floyd on the Continent, and Lawes and Gilbert in this country, farmers are largely indebted for elaborate and useful researches into the chemistry of food. At the same time a great deal remains to be done before we can get much deeper insight into the mystery of nutrition than we possess at the present time. Certain principles, however, have been distinctly established by the conjoint labours of the men whose names I have just given. We undoubtedly possess certain advantages over the generation which immediately preceded us. Amongst others, is the advantage of being able to select with greater certainty the kind of food which is best adapted to particular cases, whether it be the case of working oxen, of milch cows, or of fattening stock; and we have also learnt from the chemical and physiological researches of the men whose names I have just mentioned to form a more correct estimate of the real money-value of food. In a single lecture, I need hardly say, it is impossible to state fully all the principles which chemists and physiologists appear to have established in relation to animal nutrition; nor is it possible, in the short space of time allowed me, to touch on the various practical applications which these principles have received, or ought to receive, on the part of the farmer. I shall therefore endeavour to limit my remarks on the chemistry of food, more particularly to purchased food, and to direct special attention to the fact that the money-value of such food is very materially influenced by the value of the food-constituents which pass through the animal into solid and liquid excrements. It is well-known that the manurial properties of different kinds of food vary exceedingly. Thus we know that the dung of animals fed upon oilcake, or upon peas, lentils, and leguminous seeds in general, is very much more fertilizing than the dung of straw-fed beasts. I need not allude to these differences, which are well-known to every practical farmer. It may be useful for us to inquire into the relative manuring values of the principal kinds of purchased food. The following list probably includes all, or nearly all, the articles of food which at the present time may be bought in the market, and which are employed by the British farmer as auxiliary feeding materials—linseed, linseed-cake of various kinds, earth-nut cake (commonly called nut-cake), rape-cake, cotton-cake (decorticated and undecorticated). These cakes form, so to speak, that class of purchased food. Secondly, we have beans, peas, lentils, and fenngreek. These leguminous seeds form a second natural order of purchased food. In the third class I have arranged together the farinaceous seeds—Indian corn, wheat, barley, oats; and, by way of appendix, I have added malt, malt-dust, bran, and pollard. Then, in a fourth class, I have put together the following materials, which are now and then in the market, and are useful auxiliary foods: Palm-nut meal, locust-beans, brewers' grains (which may be had at a moderate price by farmers who are well situated for obtaining them), and molasses. On these different classes of food I will, with your permission, make a few remarks. In every kind of food, I need hardly say, we find the following classes of food-constituents: Nitrogenous, or flesh-forming substances; and fat-producing substances, which may be conveniently divided into two groups, in their order of merit—that is, ready-made fat, and starchy or sugary food. It is well to mark this division, because ready-made fat is much more valuable than either sugar or starch. Indeed, I shall not be far wrong in saying that one part, in weight, of fat or oil is as valuable as a feeding material as two-and-a-half parts of sugar or starch, or any analogous compounds. Among starchy compounds I include the vegetable jelly pectine, and pectinous substances; and not far removed from starch and more digestible pectinous matters is the young cellular fibre, which is digestible to a considerable extent, and which ought to be taken into account in estimating the value of different articles of food. Then we have in all feeding materials woody fibre, of which it may be said that the more concentrated it is the better food it makes. Lastly, we have the mineral matters; which play an important part in the animal economy, inasmuch as they supply bone materials, and also the various salts which are requisite in the formation of blood, and are invariably present in the juices of flesh and other secretions. Now, if we examine the different classes of food to which I have just alluded, we shall find that the relative proportions of the chief feeding constituents in them, the nitrogenous and the non-nitrogenous matters, vary exceedingly. The nitrogenous substances, or flesh-producing substances, as they are very generally called, although in reality they do not produce *par excellence* butcher's meat, or soluble matter, are particularly abundant in all kinds of oilcake and leguminous grains. Decorticated cotton-cake, and, next to it in order, earth-nut-cake, are extremely rich in nitrogenous substances. Leguminous seeds very nearly approach oilcake in the proportion of nitrogen. Cereal grains contain on the average only half the proportion of nitrogenous substances contained in leguminous substances. Now, if we inquire upon which of the various constituents the feeding value of the articles of food given to stock really depends, whether it is on the nitrogen, or the fat, or the sugar, or the starchy compounds, we shall arrive at the conclusion that their money-value depends not so much on the amount of flesh-forming constituents, or in other words, on the amount of nitrogen which the different kinds of food are shown by analysis to contain, as on the proportion of ready-made fat and substances capable of producing fat. As I mentioned just now, the food which is richest in what are commonly called flesh-forming constituents does not in reality produce most easily or most abundantly butcher's meat. You must remember that in butcher's meat we have invariably a mixture of lean muscle, fibre, and fat; and this mixture is much more readily produced from a fair proportion of albuminous matter in food, with an excess of starchy substances or with an excess of ready-made fat, than it is produced from food in which there is an excess of flesh-forming constituents—albumen, caseine, gluten, or any of the other flesh-constituting matters which in the animal economy answers the same purpose. It is well to bear in mind, then, that the food which is richest in nitrogenous, or what are called flesh-producing matters, is not exactly that description of food which produces at the lowest cost, or most readily, butcher's meat. The value of oilcakes, I may remark—and it is important to bear this in mind in connection with the relative value of different oilcakes—the value of oilcakes depends in a great measure on the amount of ready-made fat which they contain. Hence a foreign cake, which is poor in oil and which has been very hard pressed, is not so good as a meat-producing auxiliary food, as good English oilcake which has not been squeezed much on the passage. Perhaps that is one reason why the hard-pressed Marseilles cake is not so well adapted for the fattening of stock as it is for young stock. Why is it not such good fattening material as well-made English cake? Because English cake is generally richer in ready-made fat and oil. Regarded merely as feeding materials, the various food constituents follow each other in value in the following order: The most valuable is ready-made fat and oil; next in money value come starch, sugar, and pectine; nearly equal to starch or sugar is quite young digestible cellular fibre; then come the albuminous substances—gluten, caseine, vegetable albumen, and analogous materials; lastly, we have mineral substances and woody fibre, which I need scarcely say possess scarcely any feeding value. The money value of food, however, as I have already intimated, does not depend simply upon the actual amount of feeding material which it contains, but also upon the value of the fertilizing elements which pass through the animal into dung. Let us, therefore, inquire which of the food constituents easily pass into dung, and what is the money value of these fertilizing constituents. First, then, we have to consider whether fat, starch, or sugar easily passes through the animal. They sometimes do pass through. If cake, for instance, which is badly bruised is given too abundantly, or if oilcake is given badly broken or too abundantly, a good deal of ready-made fat passes through the animal, and considerable loss is experienced in that way: for, though ready-made fat, and starch, and sugar are most valuable feeding constituents, they absolutely possess no value whatever as fertilizing constituents. We should, therefore, aim at passing the food constituents belonging to the fatty or starchy matters as thoroughly through the animal's body as possible. We should take care so to feed the animal that the starchy food, constituents are as completely burnt up or altered as it is possible for the animal to alter them, in order that no undigested starch or unaltered oil or sugar may pass through the body, for none of those materials has the least fertilizing matter. It may be objected to the view I take of the subject that there are several oily substances renowned for their fertilizing value, such as whale blubber, sprats, fish refuse, and similar oily substances. I am quite aware that those materials which are largely impregnated with oil are frequently used with great advantage as fertilizers; but I would observe that they owe their fertilizing value entirely to the nitrogenous matter which they contain, and not in the least to oily matters. They would be all the better if they possessed no oil whatever. For oil, fat, starch, sugar, pectin, and similar things, consist of three elementary substances—carbon, hydrogen, and oxygen—only. They contain neither mineral matters that are of any fertilizing value; nor the element nitrogen, which in feeding-materials that readily decompose produces ammonia. At the best, non-nitrogenous substances can only produce carbonic acid; and this feeding material we have in abundance in the atmosphere as well as in the soil, where it is continually being generated during the decay of the vegetable remains of former crops. In the next place we have to consider the nitrogenous matter which passes through the animal. All nitrogenous substances contain, on an average, about 16½ per cent. of nitrogen. Consequently they produce on decomposition a considerable amount of ammonia. Some very accurate experiments have lately been instituted on the continent, with a view to ascertaining how much of the nitrogenous constituents of food pass through the animal. For many years we have known that by far the largest proportion of nitrogenous matter passes through the animal and is recovered in the dung. The loss of nitrogen which the food sustains in passing through the body has been variously estimated. By some it is stated to amount to one-tenth, and by others to one-fifth, of the total amount of nitrogen in the food. Recent experiments, however, seem to point out that the loss in nitrogen is not so great; that probably not more than one-sixteenth part, if so much, of the total amount of nitrogen is lost when the food passes through the animal. Of course in young stock a little of the nitrogenous food is required for the building up of the muscle; but even here the total amount of nitrogen which is recovered from the food in the dung is very great, in proportion to what is assimilated by the body, or may be supposed to be lost. And, indeed, some recent experiments, in which everything has been carefully weighed, show that the loss is even less considerable than 6 per cent. However, we have to bear in mind that we cannot perfectly collect the excrementitious matter. Some loss will be experienced by a slight fermentation, and so on; a small proportion of the nitrogen in food also will probably escape through the exhalations of the lungs and the skin. But I may remark that very little of the nitrogen of food is lost by fermentation, or is necessarily lost in the keeping of farmyard manure. The mineral matters, excepting a small fraction only of the total amount of food, pass entirely into the excrementitious matters. Now, of the various mineral constituents, we have only to consider two—namely, potash and phosphoric acid. We have then to deal, in estimating the fertilising value of food constituents that pass into the dung, with the three matters following: Nitrogen (estimated as ammonia), potash, and phosphoric acid. By ascertaining how much ammonia passes through the animal, how much potash, and how much phosphoric acid, we can form a very close estimate of the money value of the dung which is produced by different articles of food. In a very valuable paper which Mr. Lawes published in the year 1862, he gives the average composition of the principal kinds of food; and from the average composition, by making the proper deductions for loss in nitrogen, the value of the food constituents which pass into the dung may be estimated with tolerable accuracy. Indeed, Mr. Lawes made such an estimate in a circular which he published some time ago. At that time, however, I may observe, ammonia was much more expensive than it is at present. On the other hand, phosphoric acid was cheaper then, and potash has been cheaper since the discovery of the potash mines in Saxony. The money estimates given by Mr. Lawes are based on the prices of ammonia, potash, and phosphoric acid, current in the year 1862. I believe Mr. Lawes estimated ammonia at 8d. a-lb., phosphoric acid, calculated as phosphate of lime, at 1d. a-lb., and potash at 2d. a-lb. Now, in the following estimates, I have calculated ammonia at 6d. a-lb., phosphate of lime at one-half more than is given in the estimate of Mr. Lawes, or 1½d. a-lb., and potash at one-fourth less than Mr. Lawes's estimate, also 1½d. a-lb. These prices agree better with the money value at which other fertilizing constituents can now be purchased in the manure market. According to the data which I have been able to find in various publications, and many of which have been carefully collated by Mr. Lawes, I have calculated the value of the excrementitious matter from one ton of food consumed. I find, then, that linseed cake is worth as a fertilizer alone, on account of what passes through the animal, £3 15s. 8d. a-ton. Mr. Lawes, I think, gives it above £4. My estimate, therefore, is somewhat lower. Linseed cake I estimate at about 10s. a-ton lower than the estimate of Mr. Lawes. And linseed is worth as a fertilizer £2 17s. 9d. a-ton. That is considerably less than the fertilizing value of linseed cake, and this ought to be taken into consideration in estimating the relative value of linseed and linseed cake in feeding materials. Decorticated-cotton cake is worth as a fertilizer £5 6s. 6d. a-ton according to my rates of charges, which are certainly not too high. The ordinary English cotton cake contains a little more than one-half the amount of nitrogen—it is also much poorer in phosphate of lime—than cake which is made from the shelled seed, and is worth only £2 18s. a ton. At the present prices at which English cotton-cake is sold, it is, in my opinion, by no means a cheap food; but much dearer in proportion to the price at which the decorticated cotton-cake can be obtained. Earth-nut cake, decorticated, is worth £4 18s. a ton; and the undecorticated, £2 10s. a ton. Rape cake, which possesses even a greater fertilising value than linseed cake, is worth, according to my estimate, £4 0s. 9d. a ton. Beans, peas, and lentils are worth, in fertilising constituents, which actually pass, for I have made an allowance for loss, £3 2s. a ton. All the leguminous seeds have about the same fertilising value, and the same allowance is to be made for the constituents which pass into the dung. Indian corn is worth only £1 5s., wheat £1 7s., barley £1 5s., malt £1 6s. There is, therefore, no very great difference in the cereal grains, as far as their fertilising constituents are concerned. Bran and pollard, which are much richer in nitrogen than the fine flour, possess considerable value as fertilisers: they are worth £2 15s. a ton in fertilising constituents. For those who desire to obtain a good concentrated dung malt-dust is one of the cheapest foods that can be bought at the present time. Taking into consideration what passes through an animal, I find that malt-dust is worth £3 11s. per ton, while rice-meal, on the other hand, is worth only from 15s. to 25s., according to quality. If there is much husk, it is not worth so much. The husk of rice consists of woody fibre and silicious matter chiefly, and is not to be compared to the husk of such grain as Indian corn. Palm-nut meal is worth as a fertilizer £1 14s. per ton. Still lower is the value of locust beans, which are only worth as a fertilizer about 18s. 3d. per ton. In the same way brewer's grains are worth 12s. per ton, and as a fertilizer molasses have no appreciable value. I think you will agree with me that we may derive some useful information from these estimates. We shall find that the money value of purchased food is very much regulated by the value of what passes through the animal, and that, after all, linseed cake is by no means a dear cake, inasmuch as a considerable portion (fully one-third) of the money expended upon it is recovered in the dung. We may learn also that decorticated cotton-cake, which can be had at about £9 per ton, is the cheapest cake for those who are anxious to produce good rich manure. Rapecake is also a very valuable feeding material, and cheap, inasmuch as more than one-half its cost is returned in the manure. Good rapecake at the present time can be bought at about £7, and of that £4 is recovered in the manure. These are not mere fancy statements, but the result of practical inquiry. The Norfolk farmers pay as much as £5 per ton for rapecake as manure, and no doubt it is worth as much to them. I wish to add as to malt-dust, that where it can be obtained it is a particularly cheap kind of food; and I am not aware that adequate attention has hitherto been directed to the amount of money which is recovered in manure. I think sometimes you can obtain again the full money value in the dung; so that if malt-dust has no feeding value whatever, it may answer your purpose to buy it merely as a manure. Another practical lesson we may learn is that brewers' grains, which are worth £12 per ton in many places (although they can sometimes be bought for less than 3d. per bushel), are worth buying simply for the manure they make. Even if you purchase at the rate of 4d. per bushel, you can get more manuring matter for your money than in most other fertilizers. At 6d. per bushel, I should still say that brewers' grains were still cheap; hence, the London cowkeepers are very anxious to buy them. Perhaps one of the cheapest fattening kinds of food is palm-nut meal. In that we get more fattening material at a moderate price than in oilcake; but it is a food that is not rich in nitrogenous matter, and therefore a little deduction must be made from its total money value as a fertilizer. These, then, I submit to you as some of the practical lessons that have occurred to me in studying the subject, and it was because of them that I suggested the subject to our Chemical Committee. I consider that sufficient attention has never been directed to the money to be recovered in dung by a judicious expenditure for purchased auxiliary food (cheers).

The Chairman said those present were very much indebted for the highly interesting and valuable lecture which the Professor had delivered—all the more valuable because it dealt with a matter that had never been sufficiently considered by the Society. There had been a great many discussions upon the value of different kinds of food for mere feeding purposes, and there had been frequent analyses of them; but sufficient prominence had never been given to the value of the residuum. They all knew that one man could feed animals at a profit, while another man, under the same circumstances, experienced quite a different result. He remembered a discussion that took place at the Central Farmers' Club on the cost of feeding animals; and there was a difference of at least fifty per cent. in the different costs brought forward. There was, as was well known, such a difference in the cost of various articles, that it had always been considered a great point to economise as much as possible, in order to prevent the value of the food going into the manure. The value of manure was £5 to £7 per ton, the value of food would be about £12 per ton, and the value of beef about 8s. per stone, or £64 per ton. It was clear that, if one could turn an additional portion of the food, by good management, into beef, it was very desirable. The lecturer had shown that in certain kinds of food there were many important elements, very good as beef and mutton-producers, that were combined with other elements which, though of no great value as food, were valuable for their manurial properties. Perhaps it might not be more costly, in the end, to buy food which had great manurial value, combined with an equal quantity of flesh-producing elements. This was a very important point for consideration. They were all, probably, alive to the importance of not using too great a value of concentrated food. Some agriculturists made great mistakes on this point, and had failed egregiously in cattle-feeding, by not mixing highly-nitrogenised compounds with sufficient quantities of food of the woody-fibre quality. It was a significant fact that the instincts of an animal invariably led it not to take more than was sufficient of highly-concentrated food, while it would afterwards turn to stubble, straw, &c. On behalf of those present, he begged to thank Professor Voelcker for his valuable lecture (cheers).

Mr. Randall said it was always very gratifying to find the results of science corroborating practical experience. The general effect of the lecture had been to show the harmony between science and experience in a remarkable degree. In one respect, however, his practical experience did not run with the lecturer's scientific examinations, namely, with reference to the comparative value of linseed oilcake and other foods enumerated. All farmers would tell you that the difference was most marked between a portion of land where sheep fed upon oilcake had been feeding, and another portion of the same ground occupied by sheep that had been fed upon roots, or food of a similar kind. This was a matter that had been put to the test for generations, and the result was that nothing tried had by any means proved to be equal in manurial value to good linseed oilcake. Straw had been spoken of as not adapted for young stock. His own impression was that it was only in conjunction with cake that straw was suitable for young stock. The Lincolnshire farmers kept their young stock entirely upon straw and cake, and very well they found it answer. Young cattle would eat a good deal more straw when they had cake, and the admixture always imparted more vigour to the constitution. Indeed, it was absolutely essential to keep young stock upon straw in the present day, when so much stock was left that it would be found impossible to give them nothing but hay. As to cotton cake, he feared that too much inducement must not be held out for its large consumption. Whether decorticated or not, it was not, to say the least, a safe food to give to young stock. His idea was, that in considering these matters they should start with a certain money value, and not the weight of the stock. He had frequently, more especially upon sheep, carefully tried the effects of different kinds of food in what might be termed the manufacture of mutton, and in every instance linseed cake had beaten everything else hollow. As far as his experience went, carob beans, notwithstanding the amount of sugar they contained, were little better than straw. When he had used them he had invariably arrived at the conclusion that, however likely their constituent parts might be, they added nothing to the weight of the sheep as compared with roots. Returning to the manurial properties of these foods, he again said they must all have seen enough to be perfectly satisfied that none could be compared with oilcake (Hear, hear).

Mr. Torr said his experience of cotton-cake was that it must be used at a much lower price than he had ever seen it, to come into comparison with good English oilcake. The more cotton-cake was used, the less it would be liked. Under any circumstances, he believed it would only be used by those who had never used oilcake. He had used some this year, and had found it not half so cheap as good English oilcake. The great merit of these feeding mixtures was not the predominance of one particular thing, but the combination of various things of which the compound was formed. In feeding, the digestion of the animal should be considered above all things. This was shown in the cart-horse. To crush all corn, and use it with a little vegetable matter or salt, added at least one-third to its value. Again, sprouted barley he had found a third better than barley itself. He had used this for the last quarter of a century, in spite of malt-taxes (a laugh). The lecturer had let down English linseed-cake rather more than it deserved. He (Mr. Torr) thought it was not possible to keep old manure without its losing nitrogen; and if it were highly concentrated and well made, it was not right to expose it too much.

Mr. Holland, M.P., said he was always pleased to find that science and practice went hand-in-hand; and the lecture they had been privileged to listen to was additionally attractive because of the proof it gave that they were combined. Referring to the points that had been urged, he would remark that the fact that a young animal would take large quantities of straw showed how unerring nature was in her laws. We were in the habit of giving our cattle at an early age rich stimulating food; and the animal showed his sense of its artificial character by often leaving it, to feed upon straw. He regretted that there were not more members present to carry on a discussion—not representing science on the one side, and practical experience on the other, but showing how the two were harmoniously blended. He feared that, as a rule, they did not know so much of science as agriculturists should, and believed it was absolutely essential that they should be acquainted with the elements of the materials they used in feeding their stock. This would enable them to judge whether they were feeding in a mode that would repay them, or were expending too much upon nutritious qualities, and preventing themselves from getting the profit they ought to get by making a large portion of the food simply bulk. These matters had been most ably treated by the lecturer, to whom he would take this opportunity of tendering his personal thanks (Hear, hear).

Mr. Milbank said he had made experiments, chiefly for amusement, in the feeding of stock upon various kinds of food, and he could corroborate most strongly the argument that had been advanced during the discussion that there was nothing like linseed. He had tried both rape and cotton. Although his sheep undoubtedly did thrive on cotton cake, he could not conceal from himself that he had had several lamentable accidents in consequence of using it (chiefly producing inflammation), such as he had never known with linseed. When animals were confined cotton-cake was simply injurious, and the sheep in the open air did not thrive anything like so much as those fed upon linseed. Many animals absolutely refused to eat it. That he obviated by steaming the cake in a portable boiler, and then the food was somewhat better relished, but not in the same way as linseed. With animals it was much the same as with us—what we liked we thrived upon. At any rate, they would thrive least of all upon food they partly ate and partly left. The lecture had convinced him it was better to keep manure under cover than out of doors. His observation taught him that hay and straw were of themselves of little value as manure. He should be obliged if the lecturer would tell him the money value of hay as manure.

Professor Voelcker; Hay is richer in nitrogen than straw. Straw as a manure you may take at about 8s. per ton, and hay would be about £1 15s. Therefore, it is of little value as manure.

After a brief conversation the meeting separated.

Monthly Council: *Wednesday, April* 3, 1867.—Present—Mr. Thompson, President, in the Chair; Earl Powis, the Earl of Shrewsbury and Talbot, Lord Chesham, Lord Tredegar, Lord Walsingham, Major-General the Hon. A. N. Hood, Sir A. K. Macdonald, Bart., Sir T. Western, Bart., M.P., Mr. Amos, Mr. Barthropp, Mr. Cantrell, Colonel Challoner, Mr. Davies, Mr. Dent, M.P., Mr. Druce, Mr. Brandreth Gibbs, Mr. Holland, M.P., Mr. Hornsby, Mr. Hoskyns, Mr. Jonas, Colonel Kingscote, M.P., Mr. Lawes, Mr. Milward, Mr. Pain, Mr. Randell, Mr. Read, M.P., Mr. Sanday, Mr. Robert Smith, Mr. Torr, Mr. Turner, Major Wilson, Professor Wilson, Mr. Jacob Wilson, Mr. Frere, and Dr. Voelcker.

The Rt. Hon. Earl Cathcart and the Rt. Hon. Lord Chesham were elected Governors of the Society.

The following new members were elected:

Bagot, Rev. R. Wolfe, Foulstown Glebe, co. Kildare
Baumbach, H., Southelmham Hall, St. Cross, Harleston
Beales, John, Hopton, East Harling, Suffolk
Blencowe, George, Bury St. Edmunds
Bridges, Harry, Stowmarket
Burgess, John, Edenham, Bourne, Lincoln
Catchpole, Thomas, Hawstead, Bury St. Edmund's
Clinton, Lord, Heaton Satchville, Beaford, Devon
Colvile, W. E. A., Horningsheath, Bury St. Edmund's
Costerton, Charles Fisher, Scole, Norfolk
Everson, Edgar James, Harleston, Norfolk
Gayford, George, Rymer House, Thetford
Gooderham, George, jun., Monemden, Wickham Market
Gray, Edward, Parnham, Suffolk
Greig, David, De Grey Road, Leeds
Halls, Charles, Lavenham, Sudbury
Halls, Joseph, Denham Castle, Bury St. Edmunds
Hawken, Thomas, Mellingey, St. Issey, Bodmin, Cornwall
Henniker, Captain Frederick, Peppingford Park, Uckfield
Hitchcock, Thomas P., Bury St. Edmund's
King, John Lyles, Camois Hall, Woodditton, Newmarket
King, R. W., Brinkley Hall, Newmarket
King, Thomas, Preston, Bildeston, Suffolk
Kyngdon, Francis Boughton, the Bank, Margate
Merrell, Joseph, Guildhall Street, Bury St. Edmund's
Paget, Col. Leo. Grimston, Park Homer, Wimborne, Dorset
Paine, John Denton, Risby, Bury St. Edmunds
Palmer, Leonard J., Snetterton, Thetford
Partridge, George Anthony, Bury St. Edmunds
Peppercorn, John Hutchinson, Eaton Socon, St. Neot's
Robertson, William Rountree, Norton Hall, Ongar, Essex
Salmon, William, Bury St. Edmund's
Scott, William, Hopton, East Harling, Suffolk
Shaw, Rev. Morton, Rougham Rectory, Bury St. Edmund's
Stanley, Henry, Fornham St. Martin's, Bury St. Edmund's
Taylor, J. W., 38, Chester-ter., Regent's-pk-, London, N. W.
Wallis, Serjeant, Granchester, Cambridge
Webb, John, Hawkedon, Clare, Suffolk

Finances.—Major-General the Hon. A. N. Hood, chairman, presented the report, from which it appeared that the secretary's receipts during the past month had been examined, and were found correct. The balance in the hands of the bankers on March 31 was £1,382 17s. 8d., £1,900 remaining on deposit at interest. The balance sheet for the quarter ended March 31, 1867, and the statement of subscriptions and arrears was laid on the table, the amount of arrears then due being £1,135.

The committee recommended that application be made for terms of printing the catalogues for the Bury Meeting to four printing establishments, with a view to a reduction of the present cost. This report was adopted.

Weekly Discussions.—The Journal Committee requested the instruction of the Council upon the question whether a lecture or discussion shall be held on the 4th of June, that being the day preceding the monthly council, and if not, on what day it shall be held. It was ultimately arranged that a lecture should be given on Wednesday, the 29th of May, at half-past twelve.

Journal.—Mr. Thompson, the president, announced that the issue of the Journal has been unavoidably delayed by the preparation of the reports on steam cultivation, but they are all now intype, and the Journal will be published by the middle of this month.

Bury Meeting.—The Earl of Powis reported that the committee had ordered the insertion of the usual advertisements for tenders for refreshments in the show-yard; they recommended that a sum of £50 be assigned for bill-posting in the district, and that the report on steam cultivation be kept on sale in the catalogue stalls. This report was adopted. On the motion of the Earl of Powis, seconded by Mr. Turner, it was resolved that when a reserved number is placed upon any animal by the judges, a card notifying the reservation be affixed to the stall in the same manner as the cards of prizes and commendations are affixed.

Steam Cultivation Inquiry.—The President informed the Council that up to the present time the committee had paid £602, and have no reason to think that the estimate of £750 will be reached, exclusive of the cost of preparing the reports, which may fairly be charged to the account of the Journal. The reports of the three committees of inquiry will be published in a separate form; they will fill more than 300 pages of the Journal, and be published at 5s. each.

Advertisements.—Major-General the Hon. A. N. Hood reported that the Committee appointed to inquire into this subject recommend that the general advertisements be discontinued in the *Magnet*, *Athenæum*, and *Economist*; but that as regards the Journal advertisements, they be continued in the *Athenæum* and *Economist*; that general advertisements be inserted in the *Field*; and that the Secretary be instructed to prepare amended forms of the advertisements, and ascertain from the following papers, viz., *Mark-Lane Express*, *Bell's Messenger*, and *Agricultural Gazette*, their prices for insertion; that a smaller die be prepared for use with all advertisements in the weekly papers; and that advertisements of lectures be inserted in the agricultural papers only. Th isreport was adopted.

Education.—The Earl of Powis, chairman, made the following statement of the general results of the system adopted by the Education Committee:

> There have been three examinations, two in connection with Cambridge, one in connection with Oxford.
>
> The first Cambridge took place in December, 1865; there were then 120 candidates, 27 senior and 83 junior, and 13 (including 3 seniors) for the Society's subjects of mechanics and chemistry applied to agriculture. Out of the number of 27 seniors, 10 first-class prizes were awarded and 8 second-class, while out of 83 juniors, 6 first-class and 12 second-class prizes were awarded.

At Oxford, in June, 1866, there were 45 candidates, of whom 29 were senior and 16 junior, 10 for mechanics and 8 for chemistry applied to agriculture: out of the whole number of 29 seniors, 7 first-class prizes were awarded and 9 second-class, while out of 16 juniors, 5 first-class and 7 second-class prizes were awarded.

At the second Cambridge examination in December, 1866, there were 74 candidates, of whom 21 were seniors and 45 juniors, and 10 (including 2 seniors) for the Society's subjects. Out of the 21 seniors, 4 first prizes and 8 second-class prizes were awarded, while, out of 45 juniors, 6 first and 10 second-class prizes were awarded.

In all these three examinations nearly the whole number of candidates, both senior and junior, entered for the general examinations.

As regards the Special subjects, viz., Mathematics, pure and applied, Chemistry, Zoology, Botany, and Geology, a large majority (in one case three-fourths, in another case seven-eighths) entered for the mathematical prizes, while but a very small minority competed for the prizes in the remaining subjects.

Mechanics and Chemistry applied to Agriculture: in the former of these subjects there have been altogether at the three examinations 25 candidates, among whom 3 have won first prizes, and 5 second prizes; while in the latter subject there have been 27 candidates, among whom 4 first and 5 second-class prizes have been distributed.

This statement was received by the Council.

Lord Powis then moved that the grant of £300 to the Education Committee for the year 1867 be renewed, which was acceded to. Lord Powis then reported that the Committee proposed to frame a list for Scholarships and Prizes at the Cambridge Local Examinations in December next, substantially the same as that of last year, but subject to such minor alterations in detail as the Committee may find expedient. This proposal was supported by Mr. Dent, M.P., the President, and Lord Walsingham; and opposed by Mr. Holland, M.P., General Hood, Mr. Randell, and Mr. Turner; and on a show of hands was lost by 6 ayes to 16 noes. The Earl of Shrewsbury then moved, seconded by Mr. Wren Hoskyns, that a Special Council be held on Thursday, the 2nd of May, at 12 o'clock, to determine on the appropriation of the Education Grant (1867), which was carried.

Committee of Selection.—The President reported that the Committee recommended that the vacancy caused by the death of the Marquis of Exeter (a Vice-President) be filled up by the election of the Earl of Cathcart, and the vacancy caused by the death of Lord Feversham (Trustee) be filled up by the election of Lord Chesham.

Also that the vacancy in the Council caused by the election of Lord Tredegar to be a Trustee shall be filled up by the election of the Right Hon. Sir John Trollope, Bart., M.P.

Printed lists have been prepared by the instructions of the Council, showing the number of subscribing Members, and number of Members of Council resident in each of the Society's county districts, and in each of the counties composing those districts.

This Report was adopted.

On the motion of the President, seconded by Mr. Turner, the Rt. Hon. Lord Chesham was unanimously elected a Trustee in the room of Lord Feversham, for which honour his lordship returned thanks. The Rt. Hon. Earl Cathcart was unanimously elected a Vice-President in the room of the late Marquis of Exeter, on the nomination of Lord Walsingham, seconded by Mr. Dent, M.P.; and the Rt. Hon. Sir John Trollope, Bart., M.P., was unanimously elected a Member of Council in the room of the Rt. Hon. Lord Tredegar, elected a Trustee, on the nomination of Mr. Torr, seconded by Mr. Milward.

Country Meeting of 1868.—Memorials, with plans signed by the Mayors and Town Clerks of Derby, Leicester, and Nottingham, were presented, soliciting the Council to hold the Society's Country Meeting at those places in the year 1868; and a committee consisting of Lord Chesham, Mr. Cantrell, Mr. Brandreth Gibbs, and Mr. Torr, was appointed to inspect the various sites offered for show-yard and trial fields, and to report to the Council on the 1st May.

THE SOUTHERN COUNTIES ASSOCIATION.

A meeting of the above Society was held at the Society of Arts, Adelphi, on Tuesday, April 9. Present: Mr. Benyon, M.P., in the chair; Rev. James Beck, Mr. Cubitt, M.P., Mr. Darby, Lieutenant-Colonel Deedes, Mr. Gill, Sir J. C. Jervoise, Bart., M.P., Mr. Lyall, Sir Archibald Macdonald, Bart., Mr. C. Wykeham Martin, M.P., Mr. Rigden, Mr. Shackel, Mr. Shute (Secretary).

The following new members were admitted: Viscount Barrington, M.P., Beckett House, Shrivenham, Berks; Rev. Felix Brown, Stopham Rectory, Petsworth; Mr. H. Burra, Rye; Mr. G. C. Carew Gibson, Sandgate Lodge, Sullington, Hurst; Mr. Walter Carson, Ludgate Hill; Messrs. Cheale and Son, Southover, Lewes; Hon. Richard Denman, Coates, Petworth; Mr. Thomas Ellman, Beddingham, Lewes; Mr. C. Hay Frewen, Coghurst Hall, Hastings; Mr. Hugh Gorringe, Southwick, Shoreham; Mr. Henry Hardwicke, Sullington, Hurst; Mr. J. Heywood Hawkins, Bignor Park, Petworth; Mr. J. Heasman, Angmering, Arundel; Mr. A. Heasman, Angmering, Arundel; Mr. James Hilder, Rye; Mr. Beaumont Lubbock, High Elms, Bromley; Mr. Joseph Mercer, Seddlescombe, Battle; Lord Monson, Galton Park, Reigate; Mr. Henry Peters, Ashford, Crawley; Mr. Thomas Smith, Pix, Rye; Mr. R. Curteis, Pomfret, Rye; Mr. Henry Rigden, Lyminge, Hythe; Mr. Lucas, Shadwell, Fairlight Hall, Hastings; Mr. Tilden Smith, Beckley, Staplehurst; Mr. William Wood, Ifield Court, Crawley.

The answer of the Vice-President of the Committee of Council to Mr. Acland, in the House of Commons, with reference to the exhibition of live-stock, gave rise to a lengthened discussion, which was eventually adjourned till the decision of the Government authorities was more fully ascertained.

The appointment of a veterinary inspector was entrusted to the committee of general arrangements, to which committee were added the names of the following members: Major Aldridge, Mr. Thomas Ellman, and Messrs. J. and A. Heasman.

The Rev. James Beck read a report from the Arts Local Committee, at Brighton, stating that they had selected the new domed building at the Pavilion for the Exhibition of Works of Art and Industry, and that they had referred the details of the Art Union to the Brighton Art Union.

The secretary was instructed to request the managers of the Great Western, South Western, and South Eastern railways, to contribute to the success of the Exhibition by granting increased facilities for the transit of animals, implements, &c.

Lord Monson and Viscount Barrington, M.P., were elected vice-presidents respectively for the counties of Surrey and Berks.

The council then adjourned to Wednesday, the 1st of May, at two o'clock.

⁂ The prizes for horned stock are withdrawn, in compliance with the Order in Council.

DAIRY MANAGEMENT.

In establishing a dairy it is of paramount importance to study well the wants of the locality, so as to adopt the system of management best suited to meet those wants; and at the same time extract the utmost amount of profit from the animals, which they are capable of giving.

Nowadays the farmer is not confined to his own immediate locality, even for the sale of new milk, as a railway station within a reasonable distance of his farm, enables him to forward the milk at trifling cost to an immense distance; and he can thus, although it may be that he is very remotely situated, command as high a price for his produce as those whose farms are on the outskirts of a large city. A system once fairly established, it is better to adhere to it with firmness, even when other modes of disposing of the produce have an apparent advantage. Changing one's system repeatedly is not only a display of fickle-mindedness, but very often results in serious loss to the party so changing. At the best, the advantage gained is but momentary, and more apparent than real; the market probably having taken a different turn before the working machinery (servants included) has got into smooth-going order.

When a man sticks to a certain thing for a succession of years, and devotes all his energies to its development, he can scarcely fail of success. In the course of time he gets thoroughly acquainted with the subject, and is able to note all the points in his favour, and act upon them for the furtherance of his own interests. Thus, with the owner of a dairy-stock, experience soon teaches him how best to treat the animals as to warmth and shelter, the food, or mixture of foods, best suited to bring out certain results, the most suitable periods to have the cows calving, so as to enable him to fulfil his contracts, if he has any, or at any rate keep up a successional supply for his customers.

Milk, cream, and butter, the produce of the dairy, being articles of daily consumption, and equally indispensable in the mansion of the rich and the home of the working man, whether in town or country, renders the demand for these articles a continuous one; and there is no producer so well liked or so liberally encouraged as he who is regular in his supply, and makes it his study to meet the wants of those who deal with him, not only at certain seasons, but all the year round.

To save trouble, many gentlemen-farmers, and for that matter many tenant farmers also, let their dairies to men who make a business of it; the mode of letting varying somewhat according to locality. In some districts the payment is so much per cow for the season, paid in cash, the food allowance for each animal being fixed by mutual agreement, and supplied regularly by the owner to the dairyman; who, with such an arrangement as this, does all the work, thus relieving the owner of the stock of all trouble.

The amount paid for each cow must, of course, be regulated by a variety of circumstances, amongst which the market obtainable for the disposal of the produce must take a very prominent place. The character of the pasture must also be considered; and also the amount of house-feeding provided, not for winter only, but for the summer months also. as an aid to the grass. The capabilities of the cows for giving milk must not be overlooked, as it is a point scarcely second in importance to a regular and full supply of food.

If the breed of cattle selected should be too large for the quality of the pasture on which they are to be fed, the return of dairy produce will be small, as the bulk of the food consumed must go to keep up the system. On very rich pastures, it matters little how large the cattle may be, as they can gather abundance of food, and that of a highly nutritious quality. On such land a heavy cow of kindly milking properties gives an enormous quantity of milk—six gallons a-day being not unusual. A breed of cows of medium size is generally found to be the most suitable for dairy purposes, as they can maintain themselves in better condition on middling pasture than it would be possible for animals of a heavier class to do, and are less liable to be affected in their flow of milk if the supply of food should become temporarily deficient.

Taking everything into consideration it must be a badly managed stock, the income from which sinks anything under £10 each cow for the season. When the situation is favourable for the sale of the produce, the cash payment frequently rises as high as £15, and even more at times.

In other districts the payment is made in kind—a very fair arrangement for the contractor, the danger of loss by fluctuations in the value of the manufactured article being shared equally by both parties. When calves are reared by the dairyman for the stock-holder a certain sum is allowed for each when it arrives at the age specified by mutual agreement. When an equitable arrangement has been made, both parties are convenienced, the latter keeping up his supply of young stock without the slightest trouble to himself, and the former getting as good a price for the milk as he could in any other way, while he is at the same time repaid for the extra trouble, always supposing that the bargain has been a fair and just one, and not one-sided, which sometimes happens.

Another mode of payment is that by measurement, the contractor in this case having nothing whatever to do with the cattle, nor interfering in any way with their produce until it is measured out to him. This must be considered the fairest bargain of the three, relieving the purchaser of all anxiety as to ultimate loss, knowing as he does that he requires to pay nothing, unless for value actually received. In the case of the others, there is always some danger, or at best an under-current of insecurity, milk cows being liable to be put back in their milk from such a variety of causes. Of these, cold winds in spring and early summer operate greatly against a full flow of milk, if the animals are much exposed to their influence. Farther on in the season, the herbage often suffers seriously from drought, growth being sometimes at a complete standstill; and what food is to be gathered on the pastures becomes so dry from the sun's influence as to be exhausted, to a great extent, of its nutritive properties. During a protracted drought, unless house-feeding has been provided, there is some danger of the cows going dry altogether. Such a contingency occurring, in even a very modified degree, has a very depressing influence on the season's receipts; and disputes, not unfrequently ending in litigation, are apt to be engendered under any other arrangement than that by which the milk is sold by measure.

Although letting the dairy is very suitable, and an eminently convenient mode of disposing of its produce for gentlemen-farmers, saving them, as it does, an endless amount of trouble and personal supervision, which would be unavoidable if they retained it in their own hands, it is somewhat difficult to perceive its applicability to tenant-farmers, unless in very exceptional circumstances. It is evident that the dairyman must get a living out of his contract, and a respectable living too; such men almost invariably making money, and generally take farms on their own account after a very few years at this business. Moreover they are always ready to advance a certain sum as security for the fulfilment of their contract. If it were a profitless business, requiring all possible energy to make ends meet, they could not of course do either the one thing or the other.

Now we do not see why a tenant who is living exclusively by his farm should throw away a large portion of the profit of that farm, by letting his dairy to another. Whatever profit there is to be had by the hiring of land, after all expenses are paid, belongs to the hirer, and to him alone; and we consider that it would be just as reasonable for the farmer, did his lease permit him, to sell the whole of his growing crops off the land every year, to save himself trouble, as to let another share with him the profit of the dairy.

There are many ways of disposing of dairy-produce profitably, the foremost being obviously that in which the milk is sold warm from the cow. When this system, from proximity to a large town, or within easy access to it by rail or steamer, can be conveniently adopted, it is unquestionably the most advantageous to the producer. The price for new milk is in every populous district relatively higher than the price of the manufactured article, the source of supply for the former being necessarily circumscribed; whilst the latter, from its portability, can be, and is obtained at very slight cost for carriage, from the most distant parts of the kingdom, from the continent of Europe; and even from America.

Not only, therefore, is the income considerably larger; but from the milk being disposed of at once, the expenses connected with its management are very much reduced. When the cows are liberally fed, and the price got for their produce an average one, there is no branch of husbandry that gives the farmer such an overflowing return as the dairy does, when the milk is sold from the cow. In the present state of farming it may very fairly be supposed that this is the surest and quickest mode of attaining a competency. There is no article of farm produce so little liable to fluctuation as this: corn, beef, butter, and wool may, and have often gone down below the paying point, but new milk scarcely ever varies.

Of late years milk has shown a decided tendency to rise in price—no matter how depressed the state of trade in the large cities, or how low the quotations for other articles of food. The average price of new milk may be taken at eightpence per imperial gallon. In some large cities it is double that price at certain seasons, and in the metropolis it is even more; but such prices are exceptional, and affect the general average but very slightly. On the other hand, we are aware that many large stock-owners are very glad, and consider themselves extremely lucky, if they can get sixpence a gallon for the summer and sevenpence during the winter months for their milk as it comes from the cow. There are districts where 5½d. for the one season and 6½d. for the other can only be obtained; but this is too low at the present price of butter and value of stock, and the only advantage gained by selling milk at these rates over the manufacture of butter and rearing of stock is, that there is less trouble and a certain saving effected in servants' wages, fuel, &c. At eightpence a gallon the return from a good cow is highly remunerative, and amounts to a very respectable sum during the ten or eleven months she is in milk.

Taking 600 gallons as the amount of her produce for that period, we have the large sum of £20 received from one cow. It may be assumed by some that 600 gallons of milk is not a large amount for a good cow to give in the course of the season. We admit at once that many well-fed cows give more, but at the same time we also aver that numbers of fairly-kept cows do not reach that amount, but, on the contrary, fall very considerably short of it.

If eightpence, then, is a paying price for this article, those who are fortunate enough to get more cannot fail to make money, as every penny on the price of each gallon is a direct addition to their profit of 50s. per cow. When the price obtained is one shilling a gallon, the sum total amounts to £30—a very handsome sum indeed. Although there must be many owners of milk-cows making more even than this, we may here mention that it is the highest we know of in our circle of farming friends; and, although the price received for the milk is one shilling a gallon, it is not every cow in the herd that will reach that sum; and even the kindliest milker will not do it, unless liberally supplied with food of the richest description, such as brewers' and distillers' grains, bean and Indian meal, the feeding being kept up with the strictest regularity.

In a dairy of twenty cows composed entirely of Ayrshires, and where the milk is disposed of at an average rate throughout the year of elevenpence a gallon, the net return from each cow amounts, one year with another, to something about £26. Being familiar with the dairy alluded to for many years, and knowing these figures to be actual facts, we come to the conclusion that 600 gallons is as much as can be calculated on as the year's return from an average cow. Six hundred gallons in this case should show a return of £27 10s. for each animal; but, as in the flush of the season the milk cannot all be disposed of new, a portion must now and again be set and made into butter, which at once accounts for the deficiency, there being a considerable loss on each gallon when it cannot be disposed of warm from the cow.

We naturally now come to that mode of dairy management which has for its object the manufacture of butter, the skimmed and butter-milk being either disposed of to regular customers, or used on the farm in rearing calves and feeding pigs. This branch of dairy husbandry differs very materially from that we have already noticed, inasmuch as it cannot be successfully undertaken by anyone, unless he is possessed of a considerable amount of practical knowledge on the subject; and even with that, requires sound judgment, constant care, and the most minute attention to details to arrive at a successful result.

Under the most favourable circumstances for the sale of his produce, the maker of butter can seldom hope to reach the average, from each cow, which can be made by the sale of new milk under even ordinarily favourable circumstances.

Of late years the difference is not so great as it was formerly, butter having risen considerably in value, the price for a great part of the year being from 14d. to 16d. a-lb, whilst not very many years ago it sold at little over half these rates.

When so situated that the skimmed milk can be sold by contract for the supply of public institutions, or by retail in country towns and villages—this article being often notoriously scarce in such situations—a good deal of money can be made, and the amount of cost annually returned from each cow very materially increased, by its sale. For sweet skimmed milk the price is seldom under fourpence a gallon, a circumstance which offers great inducement to skim before the milk has turned, as by doing so a double advantage is derived: the butter (other things being equal) is not only of excellent quality, and consequently commands the highest price, but the sale of the milk amounts to a very considerable item.

By making quality rather than quantity his first object, a good manager has the choice of a very extended market for his produce, as butter, whether salt or fresh, can be sent almost any distance. The farm on which it is made may be very remotely situated, few strange faces ever being seen in its neighbourhood, and yet its produce may, in a very few hours from its being manufactured, grace the board and delight the eye and palate of people distant perhaps a couple of hundred miles.

We ourselves know several farmers celebrated for the quality of their dairy produce, who have supplied fresh butter for many years to the leading hotels in a metropolitan city, distant over 150 miles from their farms; the hotel proprietors not only clearing all expenses connected with the transit of the butter, but paying never less than 2d. a-lb. over the price obtainable in the district where it was made. These men are all in easy circumstances, some of them having several farms, their success being mainly due to successful management in producing a good article, rather than to excessive zeal in trying to procure a great quantity.

To be successful in making a good article, the leading object to be attended to is the quality of the food supplied to the cattle. During the five months they are on the grass there is but little trouble with *quality*, as far as the food is concerned, as, unless there is some noxious weed present in the pastures, no taint can be communicated to the butter; and the reason for inferior quality, if such there be, must be looked for somewhere else.

During the winter and spring months it is quite different, as the roots which then form the bulkier portion of the food are, more or less, apt to impart a disagreeable taste to the butter, injuring its sale, often, indeed, rendering it extremely difficult to dispose of at all, unless at a considerable reduction in price. This is an alternative few relish, as it not only lessens their profit, but also wounds their self-esteem, having to accept less than the market-price for their produce. To most people the very mention of turnip-butter is odious, associating with it as they do the idea of nausea and disgust. Yet butter made from the milk of cows fed on turnips can be had perfectly sweet and good, very little inferior to summer butter, and that, too, without putting saltpetre or anything else into the pans or into the churn, to destroy the turnip-flavour. Providing the roots used are sound, and have not heated in the pits in which they have been stored, turnips make excellent food for milk-cows, the milk being very productive of butter, and the skimmed milk of very good quality. To counteract the unpleasant flavour, a small quantity of concentrated food can be substituted for a portion of the turnips. Of these foods the most suitable are crushed oats, bean, Indian, and palm-nut meals, bran, and oilcake. When a boiled feed is given morning and evening, the meal can be mixed with it with great propriety, and the animals have the full advantage of it, this being the mode of feeding practised by the most successful owners of dairy-stock; and with it they are enabled to keep the animals for a long time in full profit, and the quality of the produce is at the same time but little inferior to that made in summer. When boiled food is not given, the concentrated food can be thrown into a large tub or trough, and hot water poured over it, the steam being confined by a cover. The mass undergoes a certain amount of cooking; and when placed before the animals, it is eaten by them with great relish. Some feeders do not even go to this trouble, but sprinkle the meal, or mixture of meals, bran, and oilcake, on each cow's allowance of turnips, as it is placed before her; and so well is the dry food liked, that many cows will not touch the turnips until the meal has been sprinkled over them.

The effect the dry food has upon the quality of the butter is scarcely less than the same amount wetted; and, whatever way used, the enriching property it possesses is very striking Although we look upon bean-meal, Indian-meal, and crushed oats as invaluable aids in feeding milk cows during the winter months, enriching and improving the quality of the produce, yet we cannot leave this part of our subject without stating distinctly that excellent butter can be made with no other food than sliced turnips and hay, with the addition of a few hours' run on the pastures each day, when the weather permits. We speak from experience, as we have fed on turnips during the present season since the first of September, a feed being given morning and evening without any preparation whatever, except cutting the roots and tops of the whites and yellows, and slicing the swedes. During these seven months, not a single pound of any kind of food was used with a dairy of twenty-three cows; and the quality of the butter was such as to bring the highest price going in the district—1s. 2d. a-pound.

Not a single complaint was made of the quality of the butter, although no corrective was used with the view of neutralizing the taste imparted by the turnips. The means used were simple, and consisted of, first, good ventilation in the dairy; second, strict attention to cleanliness; third, not allowing the milk to stand too long in the pans; and fourth, churning often: our practice in this respect being to churn four times a week. Having a paying contract for sweet skim-milk, we were enabled to skim early, without fear of loss, as anything that was lost by the whole of the cream not having risen was amply compensated for by the superior quality of the milk, which was paid for accordingly. Mangolds are popularly supposed to make a superior quality of butter to that made from turnips. But our experience does not lead us to this conclusion; on the contrary, we consider that the peculiar and slightly bitter flavour of mangold butter is, to some palates, more unpleasant than even the turnip taste, and more difficult to be got rid of. As food for milk cows, we decidedly prefer turnips; but, as the mangold keeps to such a lengthened period, it becomes a matter of considerable importance to grow a few acres for late spring and early summer feeding.

Without the addition of the foods we have already alluded to, mangolds are very profitless food for milk cows, independent altogether of the taste imparted to the produce. The milk is exceedingly thin and poor, and the cream not at all rich in butter; and it is consequently imperative on everyone who studies his own interest to enrich the milk by the addition of more nutritious food. From four to eight pounds of meal in the day forms an ample allowance for each cow; and by the use of this the produce is increased and enriched, and the quality vastly improved. In feeding with mangolds, a little concentrated food is also highly necessary for the health of the animals, as the acrid juice which is largely present in this root has, even at a very advanced period of the season, such a purgative effect upon them as to reduce their condition very much.

We come, therefore, to this conclusion, and act upon it, that although a feeder of milk cows may use turnips and hay solely during the winter months, and sustain no perceptible loss through lessened quantity or deteriorated quality, yet, in using mangolds and hay, it is absolutely necessary to use a portion of meal or other nutritious food, if the owner desires to keep up the quantity and quality of his dairy produce to its fullest extent, and his animals in good health and fair condition.

All things having been done to ensure good quality that lies in the power of feeding to accomplish, it is equally important on the part of the farmer to see that the after-management of the milk is in other respects all that could be desired. The dairy should be well lighted and well ventilated, nothing tainting milk so soon as damp confined air; and the situation should if possible be such as to afford shelter from the sun's rays in summer, and some protection from extreme cold in winter. Coolness in summer is highly necessary, as if too warm the milk thickens at once, and the butter is so soft as to make it a matter of some difficulty to prepare it for the market. If too cold, the cream does not rise well, and consequently there is a certain amount of loss, unless the temperature of the dairy is artificially raised, which in practice, however, is very seldom done; and it is therefore all the more necessary to contrive a site for the dairy which commands as much shelter as is compatible with the requisite amount of ventilation. Cleanliness in the dairy and its belongings is a point of vital importance, and must be rigidly attended to, else failure will be the inevitable result. There are few more pleasant sights in connexion with a country residence than a nicely kept dairy, and it forms a great centre of attraction to visitors, a visit to it being seldom forgotten. However attractive such a visit may be when all is beautifully clean, the air sweet and pure, and the drink of cream presented so delicious, the opposite never fails to create feelings of the most unmitigated disgust.

There is considerable diversity of opinion with regard to the kind of pan most useful for containing the milk while it remains on the shelves of the dairy, and there is a pretty wide choice of material. Wooden coolers probably stand first on the list, with regard to both economy and usefulness. If made of the best oak, and not allowed to fall to pieces when temporarily out of use, they are almost imperishable; and when kept nicely scoured, the timber white, and the hoops shining like silver, they are highly ornamental on the dairy shelves. In winter they have the great merit of not cooling the milk too suddenly, a quality highly favourable to the rising of the cream. Earthenware pans are very extensively used, and possess the great advantage of being cheap, a property which recommends them to a great many farmers. Vessels made of earthenware are, if well glazed, very suitable for dairy purposes, independent of their cheapness, and hence they are very extensively used. Glass pans have of late years been brought very prominently before the agricultural public, but their high price and perishable nature have operated very much against their extended use; and while we believe them to be eminently suitable for this purpose, we consider that these qualities will always have a tendency to prevent them from being used extensively. Shallow pans are by some supposed to be more suitable for setting the milk, and more conducive to the rising of the cream than those of a deeper make; but in practice the difference is not so apparent as might be supposed. Where the dairy is a large one, the extra room taken by shallow pans is a serious objection in the height of the season; and in winter, when milk is set in too small quantity, or with a large surface exposed to the air, the low temperature will seriously interfere with the quantity of cream. During winter it is vitally essential to retain the natural heat of the milk as long as possible, and for this purpose the pan containing the milk is by some dairy managers put into another containing warm water, a plan which assists the rising of the cream most materially, and which also renders the use of a stove unnecessary.

Churns are now so varied in form, that it is difficult to say which is the most suitable, each maker claiming to have some peculiar property in the article he manufactures which makes it deserving of a fair share of public patronage. Some of them found their claims to superiority on the power they possess of bringing butter very quickly—a quality, however, not of much use when large quantities are made, as butter to be firm and sound in texture, and of good keeping quality, must, whatever be the make of churn, take a reasonable time in churning, the usual period being from twenty minutes to half-an-hour. By over-heating any churn, no matter what its construction, it will bring butter in a few minutes; but, by doing it so quickly, there is a serious loss both in quality and quantity. The barrel churn is the form now most generally used, and, when mounted on what are called patent axles, it would be hard to conceive of anything more convenient or suitable. These axles consist of two small wheels set in a frame, and fastened one at each side of the churn-stand. The churn, on being lifted on to the stand, rests in the centre of these wheels, which revolve when the churn is driven, and thus materially lessens the friction, rendering the process of churning not nearly so laborious. In large establishments a horse-gear is generally attached to the churn, and a steady horse or pony does the business admirably, the animal soon getting accustomed to the speed required, and going on until the process is finished, without the slightest looking after.

Whilst a considerable number of farmers have a good market for their dairy produce for immediate consumption, disposing of it at once in the shape of new milk or fresh butter, it is obvious that the majority from the situation of their farms must depend upon some other market for their produce than that supplied by the locality. In such cases the manufacture of cheese and salt butter becomes the principal object of the farmer, the leading markets in the kingdom being open to him for the disposal of his produce.

As this paper has already run on to considerable length, we will but briefly notice a few points to be attended to and avoided in the preparation of salt butter for a public market. To ensure success, the *first* essential is quality, the *second* quantity—a fact forced upon the notice of everyone who cares to give the subject the slightest consideration, and who compares the price quoted for the various qualities—first, second, third, &c. That there is a great deal of bad butter made, an examination of the published returns of any market will abundantly testify, the large proportion of low qualities showing unmistakably that there must be something wrong in the preparation of the article, the discrepancy being unexplainable on any other grounds than that of sacrificing quality for quantity, or otherwise very careless management. If one man can produce butter of first quality, why should not another? If that other gets even second, why should his neighbour, who has the same facility for the manufacture and sale of his produce, have to content himself with third?

Owners of a small lot of cows sometimes urge as a reasoen for producing inferior qualities that their dairy is not largt enough to fill a cask at one churning, and on that accoun they are unable to compete with him who does so. This argument does not hold good, as it is perfectly well known to merchants and dealers in butter that there are plenty of owners of only seven or eight cows who must necessarily churn several times before they can fill the usual-sized cask of from 60 to 70lbs., and who yet almost invariably succeed in securing first quality for their butter.

Non-success in producing good quality must rest during the grass season more especially with defective dairy management. Badly-cleaned vessels is a fruitful source of injury, and the cause of much loss to the proprietor. The eye of the master or mistress, or some member of their family, should be able to correct this fault, a little more boiling and a little more scrubbing being all that is required. If necessary, rather than have the quality suffer from such a cause, extra help should be given.

Letting the milk stand too long before being skimmed is a very general source of mischief, as the butter thereby acquires a taint which the most skilful manipulations will not remove. Many persons fall into, and continue this mistake, who from long experience ought to know better, the reason for continuing it being that they imagine by allowing the milk to stand for a considerable period, the whole of the cream which the milk contains will get time to rise. We believe that the bulk of indifferent butter which appears in the markets has its origin in this most mistaken idea being so frequently carried out.

Much good butter is spoiled, and a quality lost from oversalting: a practice persisted in year after year, notwithstanding all the efforts made by those who are in the trade and who are interested in the production of a superior and saleable article. To oversalt butter, with the view of increasing the weight, is a disgrace to the intellect of the present day, and almost invariably defeats itself, the loss by deterioration of quality over-balancing any advantage gained by extra weight.

During very warm weather in summer, otherwise unexceptionable butter may lose a quality, or perhaps two, on account of sponginess and general want of texture, it being often—on rich land more particularly—almost impossible to impart any degree of firmness to the mass.

When this happens, the sponginess can be completely got rid of, and the quality regained by a very simple operation. Take a large slate, and trim it, until it will just fit in the mouth of the firkin, without touching it at any part. Place the slate on the butter, a little salt being previously sprinkled to preserve it from contact, and on the top of the slate rest a half-hundred weight. In forty-eight hours the pressure will have forced out the water, and the texture will be all that is requisite for butter of first quality.

A few slates once prepared, and preserved in the dairy, will be found useful during most summers, few people when once having found out the value of this plan readily forgetting or giving it up.

With a view to full profit, and the highest average obtainable from each cow in the particular branch of dairy husbandry in which he is engaged, every owner of stock should exert himself to the utmost in providing a plentiful supply of food for his animals every day in the year. Without full feeding, whatever attention may be paid to every other portion of the management, it is impossible to obtain full profit, any pinching or niggardliness in the supply of food showing at once in a diminished flow of milk. It is better to be rather under than over-stocked, the amount of produce obtained from a small number of cows well and regularly fed being greater than that got from a larger stock which have been only moderately fed.

The peace of mind enjoyed by the owner of a well-fed stock is no mean consideration: he is not annoyed by the prospect of running short of food, and having to purchase at a very dear rate, thus throwing away a portion of his profit. His stock being well fed are in good health, these terms, with regard to stock, being almost synonymous, and even if an accident should occur, there is but little loss, the animal being in good condition. He has a pleasure in looking at his cows, and a double pleasure in taking his visitors to see them—a sleek, well-cared-for, and comfortable-looking dairy stock being a pleasant sight, and exceedingly well worth showing to one's friends.

G G

THE MARE FOR STUD PURPOSES.

At the Athy Farmers' Club meeting, Mr. CLANCY, V.S., read a paper on "The Mare for Stud Purposes:"

I shall propound no theory, but make a simple statement of facts which have come under my own observation. Certainties in horse-breeding are fallacious, yet we must be guided by general rules; and I have no fear in stating that the breeder who carefully studies the selection of his mare and stallion will far outstrip the reckless breeder—one who breeds from a mare he considers useless for any other purpose, or from a stallion because he belongs to a friend, or that he passes his house, or that he can be got for a trifle. Believe me, gentlemen, breeding under such circumstances is a bad practice, and one which has disgusted many men from breeding, simply because the animal they bred was worth nothing in the market. They went on chance and negligence, which was certain to disappoint them, and the consequence was they gave up breeding. That the character of a good horse in Ireland has deteriorated I boldly deny; that they have decreased in numbers, I candidly admit. The supply of good horses of any class in our local fairs is scant indeed, and why? Beause our breeders have become negligent in the matter, and the demand for Irish horses of all classes has materially increased. To the horse breeders of the Athy Farmers' Club I appeal to correct this deficiency; the majority of your members are Kildare men, to whom the "pride of place" "in the first flight" has been accorded, as the producers of the best racing blood in the world, through Irish Birdcatcher, Irish Baron, Harkaway, Stockwell, and Gladiateur. The Irish steeple-chaser has proved his prowess through Salamander, Cortolvin, and Flyfisher. The superiority of the Irish hunter is long known to hunting men, and the demand for this class of horse now in the market by foreign purchasers ought to stimulate the breeders of horses of this club to seriously consider the matter and supply the want. Do you not pay marked attention to the selection of your cows and bulls, rams and ewes, in your farm and garden seeds? why, then, so heedless in the selection of your mares and stallions? If I could once see a spirit of emulation amongst the horse-breeders of this club in the selection of their mares, I could assure them success in horse-breeding; I could ensure them a large profit, and prove to them and the world that the Irish horse is not deteriorating, but quite equal to the task of competing against all comers.

Before entering into detail, I would impress on you the superiority of the mare over the stallion in producing a good horse of any class. The higher we go in the scale of nature the more acute become the rules which govern her. The thorough-bred horse is the highest standard of the equine race, and I shall recount facts in the breeding of thorough-breds to prove that the mare requires more attention in her selection than in the selection of the stallion.

The Stud Book records the breeding of all the blood horses in England and Ireland, very accurately kept. If you refer to it you will find that the dams of the best horses of each year had produced good horses in every year, and in the majority of cases by different stallions, of different strains of blood. Now, let us consider this fact, that with fashionable stallions the average number of mares put to them is about forty; out of the produce of these forty mares they may get from ten to twenty good horses, and in many cases not even that number. The mare gets but one stallion put to her; consequently the stallion gets forty chances to the mare's one, and yet that one is a success.

I must observe in extenuation for any errors I may commit, that my remarks are founded on my own experience, and as such are liable to correction. I therefore trust by your discussion those errors may be corrected; for by their correction I shall have obtained that for which we should all struggle—knowledge. In the meantime, if I impart to you any information, I shall feel I have performed my duty as a member of this club.

The breeding of horses may be divided into five classes—thorough-breds, hunters, hacks, carriage horses, and horses used for agricultural or commercial purposes. As I have before stated, to the careful selection of the dam I particularly direct your attention; yet, while I advocate the selection of the dam as our *prima mobile*, don't let me be understood by you as throwing overboard the due consideration of a stallion's qualities: our great object should be to produce an animal as near perfection as possible. For this end the stallion chosen should be possessed of those qualities in which the dam may be deficient; that by combination we may expect to have produced an animal whose value will compensate us for the expense, anxiety, and trouble attendant on breeding.

In the selection of either sire or dam, the following particulars should be carefully inquired into: True blood, soundness, shape, action, age, height, and temper.

As I do not wish to particularize any class of horse, the remarks I offer are applicable to all classes. Of course, each class has its peculiarities. For instance, a thorough-bred shoulder is a bad one to put a collar on; and thorough-bred action would not answer in a four-horse plough. General rules I can only give you, and you can apply them to all classes of horse.

It is not my intention to enter into the due observance of the crossing of the particular strains of blood to produce a first-class racer, nor shall I dwell on the breeding of thorough-bred stock; the horses bred by us are of a lower class, and to those I will draw your attention.

The pedigree of a hunter does not require that nicety of selection as in blood stock; still, I would advise you to select your mare with a couple of crosses of the thorough-bred. Our hunters are oftentimes called on to perform extraordinary acts of gameness, and from the thorough-bred blood comes all their pluck and courage to stay a distance, and, by their blood-like action, to give to their riders a comfortable seat in the saddle.

In the breeding of hacks and carriage-horses pedigree is not of very great importance; and yet without a dash of thorough-bred blood in their veins, you cannot produce a horse to ride or step well. Cart-horses should be descended from parents true in blood in their own class.

The all-important point of soundness is next to be considered. It is the essential point in the brood mare for all purposes; for it is a notorious fact there are diseases of which the parents are subject, which will descend to their progeny. To guard against propagating those diseases, we should, therefore, be particular in our examination of mares required for the stud.

In the majority of cases a mare is never put to the stud until (as those wiseacres consider who act in this manner) she is fit for nothing else. This is an absurd notion, and one I would caution you against. When you believe a mare "fit for nothing else," consign her to the knacker or hounds, rather than encumber yourself with her useless progeny; for such they will prove to be.

Splint, curbs, spavin, ringbone, all diseases affecting the wind, blindness, and navicular lameness, I consider to be direct hereditary diseases; but, at the same time, they may be the product of accidental injuries or mismanagement. To discriminate between those diseases the effect of accident and those of hereditary descent is a most difficult task; I can only offer you a few general rules by which I have been guided; you will find benefit from their adoption.

The situation of splint on the canon or shank-bone I have adopted as my guide. When we have splint the result of external injuries, we generally perceive it as occupying the inner and anterior part of the canon-bones; this may be accounted for by the likelihood of the injury being inflicted by a blow from the other limb, and, consequently, may be denominated as occurring from accidental circumstances; while that the result of concussion more generally locates itself more posteriorly, and on both small and large canon-bones. This concussion may be accounted for as occurring from malformation of some of the tissues of the limb, and may be considered hereditary. Taking this view of the case, when I found a splint situated on the inner and front part of the large or small canon-bones, if I found but one limb affected I would consider the disease the result of accidental circumstances, and not likely to prove hereditary.

The circumstances to be considered with regard to curbs are—firstly, the shape of the hocks, and, secondly, if curb was present on one or both hocks. If I found sick or crooked hocks, and both hocks affected, I would pronounce the mare as being predisposed to the disease; if, on the other hand, I found straight hocks, and but one affected, I would consider the disease to be the result of accidental sprain, and as such not hereditary.

Spavin, ringbone, and sidebone I shall consider under one head, and I can say but little about them, it never having entered my imagination to breed from a mare affected with either disease. There are no circumstances that can palliate their presence, and I would strongly recommend you never to breed from a mare affected with either.

Blindness of both eyes in the mare is one of the worst affections she could be the subject of, for two reasons—firstly, likelihood of it descending to her progeny, and, secondly, her inability to fill that office for which nature destined her, to protect and shield from injury her offspring.

Broken wind, roaring, whistling, piping, grunting, thick wind, and chronic cough, I consider as direct hereditary diseases; and, although they may have been produced by bad treatment or accident, I would not recommend you to breed from a mare the subject of any of those diseases.

Navicular lameness I have found hereditary, and those mares with short pasterns and mulish-shaped hoofs are more prone to this disease.

There are other diseases to which horseflesh is heir to, such as grease, break-down, thorough-pin, wind-galls, pumiced feet, corns, &c., &c., to the presence of which (if the mare was possessed of many other good qualities) I would not attach much moment. I would wish they were absent; but, as it is quite impossible to have a perfect or faultless animal, I would rather "bear the ills I had than fly to others I knew not of."

Men of shrewd observation have asserted that the outward shape or make of a horse is more derived from the sire than the mare, and his internal qualities, as gameness, courage, action, and endurance, is specially taken from the mare. My own observation would lead me to a like conclusion; therefore, I would impress on you the prudence of particularly examining the stallion, and have him as sound as possible.

Before dismissing the subject of soundness, I would here advise you to make certain that both stallion and mare are in a perfectly healthy state; either in a diseased or sickly state will materially retard impregnation, and interfere with the healthy development of the foal.

Our next consideration is shape; and were I here to give you every point which should be present to constitute the outline of a model horse, I fear it would profit you little. A good form seldom covers a bad horse, yet very good animals are notoriously ugly creatures. It must, however, be taken into consideration that certain points which appear to interfere with the symmetry of the animal may, by their excellence, be considered beautiful by the judge of horseflesh.

When judging of external conformation, the breed, age, and condition of the animal have to be fairly considered. The horse of sixteen summers and the mare of three years old do not exhibit their natural shapes; an old stallion's muscles get wasted; he gets drooped in the back, and is otherwise out of shape; the three-year-old filly has not attained her full proportions. These circumstances should be taken into account, and full allowance given to them. To be a judge of horses' shapes can only be learned by practical experience. The ear alone makes a poor judge: take the eye as your director, and I promise you a short apprenticeship will make you a proficient in the business.

There are a few points, however, which I think necessary to mention, that apply to all mares, no matter to what class they belong—namely, that they should have blood-like heads, with small muzzles, with the cheek or hinder part of the jawbone deep and wide apart, symmetrically set on a lean and moderately long neck, well laid-back shoulders, light at their points, and thin at their withers; broad, flat knees; flat, clean legs, long in the fore-arms, straight in the elbows, short from the knee to the fetlock, with plenty of bone; oblique, elastic pasterns; large, rounded hoofs, with open heels and concave soles; broad, wide, angular hocks; good, rounded ribs; deep chests, broad loins, long hips, well-set tails; and, when standing at ease, her hoofs should neither point inwards nor outwards.

That you may have good nurses (a vital consideration; for without a good nurse you cannot rear a good foal), you should see that, even in maiden-mares, their udders should be well developed.

The age at which a mare should be bred from should not be less than three or more than eighteen years. The reason is obvious. Young mares are still growing, casting their teeth, and have quite enough to do to provide for their own wants. Old mares cannot supply that nutriment requisite for the full development of their offspring. A young stallion and an old mare have produced good stock; but I cannot say as much for an old stallion and a young mare.

Action—our next consideration—should be carefully attended to; for it is the harmony and elasticity of movement that makes weight comparatively easy to every class of horse, and it also empowers him to propel himself onward with ease to himself and comfort to his rider. It is worthy of particular notice, in the mare—for I have remarked it in numbers of instances—that the action of the foal resembled the dam's in a much greater degree than that of the sire's: consequently, you should be guided by the action of the mare in forming an opinion as to the class of horse she is most likely to produce. For instance, racers and hunters should be good gallopers; carriage-horses, chargers, and hacks should be good trotters; and cobs and farm-horses, good walkers. In giving you my opinion of the best style of action I am not a little puzzled, having seen many good horses of different styles of action; and in pointing out one for your selection, a further difficulty presents itself. Nevertheless, I shall give you what I consider the best.

The first style I shall speak of is high-action horses, who step to their chins. I object to these: Firstly, when used as riding-horses, they cause an uneasy seat to their riders; secondly, they lose time in replacing their feet; and thirdly, they are apt to become the subject of lameness by the concussion they produce with the force with which they strike the earth. There is, however, one class of horses where this style is much valued, and where, also, there is a striking illustration of the preposterous dictates of Fashion overruling the better principles of common-sense; but, as necessity has no law, as long as Dame Fashion wields the sceptre, we must bow to her commands. I allude to carriage-horses. Have, then, by all means, mares with high action when you intend breeding carriage-horses.

The second style I shall mention is that in which horses do not lift their feet sufficiently far from the earth. These are termed "daisy-trippers." I object to these, firstly, from the danger in which they put their riders' necks by their stumbling and tripping; and secondly, in meeting with the least obstacle, they change their feet, and frequently strike one foot against the other, thereby producing lameness, splints, or sore shins. Mares with dishing action, or who forge their hind and fore-feet together, are most objectionable, particularly for carriage-work. I would not breed from a mare similarly affected.

The style of action I would recommend differs from any I have mentioned. It may be known by the elasticity of the horse's movement, and the uniformity of his paces; by his elevating and carrying forward his fore-arm; by bending his knee well, without raising his feet too far from the earth; by bringing his hind-extremities well under his trunk; and by not losing time in the replacement of his feet. It is that style of movement that gives to the horse that grandeur of appearance for which his race is so justly prized, and from which the vanity of man receives so gratifying a compliment; for who, sitting on the back of a horse, carrying his head up, his neck curved, his ears erect, his eyes flashing eagerness, his nostrils dilating and contracting with impatience, his tail gracefully set, his paces even and elastic, walking as if he scorned Mother Earth, and capering with all the grace and elegance of a *danseuse*—who, I repeat, in such a position, would not feel a glow of pride and a conviction that he was indeed one of the lords of creation?

The height of the mare will depend on the class she is in—for a hunter, from fourteen-and-a-half hands to fifteen-and-a-half (a long-legged hunter is never a safe one); for the road, from fourteen to fifteen; and for carriage-work, from fifteen hands upwards.

The temper of both sire and dam should be strictly inquired into. A bad or vicious temper is a positive hereditary failing, and one of the worst faults a horse could possess.

Having now chosen your mare, spare no expense or trouble in selecting a stallion for her; and, as I said before, let him be young, sound, and possessed of all those good shapes in which the mare is deficient.

The period of heat in the mare, as a general rule, does not arrive before the month of March; but in breeding for turf purposes it is desirable it should be on in February, the age of thorough-bred horses being dated from 1st January. The benefit of having a foal dropped as close to that time as possible is obvious, as they are called on so early to perform work. The month of April, however, is quite time enough to put a stallion from which you wish to breed any other class of horse; but in every case a strict record should be kept of the dates of her being covered. You will find this useful, that you may be prepared for her foaling, a month previous to which event she should have perfect rest and quiet from all work.

To bring about *œstrum*, or heat, the mare should be placed in a warm stable, and liberally fed with nutritious food. Placing her in a stable in which other horses are housed will hasten its appearance very much. Have her every day teased by a stallion for half-an-hour. This should be continued regularly until she is in use. Care is here required in determining true heat; for a great deal of mischief arises from not attending to this. There are many mares whose irritability or shyness of disposition will cause them, through nervous excitement, to evacuate their urine. This might lead many to believe that heat had arrived, which would not be the case.

A few symptoms, however, will enable you to come to a right conclusion—firstly, when, being teased, the mare appears dead in herself, throws herself to the stallion, and evacuates her urine frequently, this evacuation being followed by the ejection of a whitish, mucous matter; secondly, you may feel a strong, full pulse, the vagina becomes inflamed and flaccid, and general nervous excitement pervades the system.

On the symptoms I have mentioned presenting themselves, you may have the mare covered. Let her be kept in a quiet situation, without food, for some time; and, above all things, she should be placed by herself, away from other horses. On the ninth day from the first cover, let her again be brought to the stallion, when, as a general rule, she will be found again in use; but in case she refuses, have her again sent on the sixth day; if she again refuses, have her sent on the succeeding sixth day; if she now refuses, let her not be sent until the succeeding tenth day, when, if she refuses, you may fairly reckon she is stinted.

If, however, she takes the horse on the first ninth day, your treatment should be as follows: After being served, let a bucket of cold water be thrown over her loins, and keep her walking about for half-an-hour; then put her into a quiet stable, and keep her fasting for some hours. Have her tried on the succeeding fifth day, when, if she refuses, continue to try her as if she had refused on her first ninth day, as I before stated. If, however, she proves in use, give her a dose of purgative medicine, and, when working it off, have her again served. I have never seen or heard of a case where this treatment proved ineffectual, or where any untoward consequence occurred from its trial.

This treatment, however, is not advisable where the mare has a foal at her foot, owing to the susceptibility of foals to take on superpurgation, which should be in all cases guarded against. With a suckling mare, a good blood-letting will answer your purpose.

The condition in which your mare is when being put to the stallion requires your consideration. A mare miserably thin or in a weak state is quite unfit, neither is a grossly fat one fit, to be sent to the stallion. You will find it a difficult task to have them stinted. Mares in hard-fed condition must be prepared with slop-mash, or allowed to run at grass, before they are fit to be served. A mare in moderate working condition is best prepared to be put to the stud.

Mares take, as a general rule, eleven months in gestation: I have, however, seen mares go fourteen months, and others but ten months. In all cases, a month's rest and quiet before foaling is most beneficial.

To ascertain whether mares are with foal or not should be our next duty. This can be known three months from the last cover, in most mares. It is useful to be early apprised if your mare is barren: you might dispose of her, or put her to work you would not otherwise have done. I have seen a great many ways tried to effect this object, some succeeding, some otherwise. Amongst the best will be found an examination *per rectum*: it is a very safe operation. The mare is kept fasting the night before. The arm, stripped to the shoulder, is bathed in very warm water, anointed with hog's-lard, and introduced into the anus. The dung-balls are all removed; when, by keeping your hand quiet for a few minutes, you may feel the fœtus jump under it.

The increase of condition in the mare is a good omen. Her frequent scratching and trembling in the paddock, and the slowness and carefulness of her movements, may enable you to give a fair guess, until the abdomen begins to drop and widen, when pregnancy will be beyond doubt. The udder will now, by degrees, enlarge until a short time before foaling, when a waxy, yellow matter will exude from the teats. When this appears, the mare will require constant watching.

As soon as the foal comes into the world, it is interesting to observe how soon it begins to suck, which, however, with a weakly foal, it may occasionally be prudent to assist it in doing, by supporting it to the teats. The first milk, instead of being prejudicial, is beneficial, as, by its purgative qualities, it brings away the contents of the fœtal alimentary canal. Should the foal appear costive, the contents of the rectum may be extracted with the finger and a small candle introduced. This, with a couple of ounces of castor-oil, will soon set all things right.

While mares are suckling, they should be well housed, and have plenty of nutritious food. I know nothing better than boiled barley and bruised oats, mixed with bran, given at morning and evening, together with a feed of corn daily, for the purpose of breaking-in the foal to eat it. I recommend the practice of giving foals boiled milk and oatmeal daily, while on the mare. This, with good shelter and water, is all they will require until about the end of September, when they should be weaned. A small leather collar placed on the foal, when weaning, is of much use, as by it you may teach it to lead and allow itself to be handled.

After weaning, mares should be carefully attended to; and they should be milked every second day, and their udders hand-rubbed with a solution of alum (an ounce to a pint of water), until they are dry of milk. They should have plenty of water, and should be liberally fed. It has been advised to feed them sparingly until it is evident they are with foal: this I think an erroneous notion.

When the mare is about to foal, she should be kept as quiet as possible, and the less fuss that is made about her the better. Should there be any symptoms of tedious foaling, or any thought that something is wrong, send at once for a veterinary surgeon.

There is one fact which, before I close, I would ask you to study—the natural gift given to the mare or stallion to produce good horses from any kind of stallion or mare. I have known ill-shaped stallions, without character as racers, produce first-class animals from every class of mare. I have seen ill-shaped mares, who never could win a shilling, produce good racers from different stallions; and I have seen well-shaped, first-class racers, both stallion and mare, produce an ugly, useless beast. These whims of Nature we cannot, of course, control; but we can learn the general rules which Nature makes, that, keeping them before us, we may at least assist her in producing the animal we require.

In conclusion, I beg to thank you for the patient hearing you have given me in my feeble attempt to afford you information on this subject. If I have been able to impart any to you, I shall feel satisfied and proud in having stimulated you in the careful selection of your mares for stud purposes. I read a paper on this subject in 1850, before the Veterinary Medical Association, in London, for which I hold their award of thanks. With seventeen years' further experience, I have revised it for your perusal.

Mr. ROBERTSON said he agreed with every word that Mr. Clancy had said in his valuable paper. The difficulty a farmer had to contend with in breeding horses was, to make it pay. Unless he could get, at the least, £80 for a four-year-old colt or filly, it would not pay; and his opinion was that not seven out of eight got that price. He allowed that, in many cases, the faults lay with the breeder, one of the principal of which was half-starving the foal.

Mr. Webber said, in his opinion, the sum and substance of Mr. Clancy's paper was this: Look to the mares you breed from. Now, to bear out that opinion, he was informed that in Arabia you could easily purchase stallions, but not mares. They laid all the stress in breeding on the mares, whilst we do the reverse, and lay it all on the stallion.

Mr. Brennan said that the breeder often sold a horse for £40 or £50, and a short time afterwards hears that £100 or £150 has been got for him.

Mr. Clancy said that horse-breeding will surely pay the farmer if he will only be as particular both in breeding and keeping as he is with his short-horns and lambs or Border Leicesters, and also be as good a judge of them. A dealer sees a good four-year-old colt in a fair; he knows him to be worth £100; but the breeder, who is not a judge, asks £50, takes £40, and then wonders very much when he hears that the dealer has doubled his money. Let the farmers who breed horses learn, first of all, to know a good horse when they see him, and then be as particular in selecting the mare to breed from as the sire.

A vote of thanks to Mr. Clancy for his paper was passed with acclamation.

THE STEAM-PLOUGH TRIALS IN SUFFOLK.

The Bury Local Committee of the Suffolk Agricultural Society have published a report of the trials of steam ploughs and cultivators, which took place at Bury St. Edmunds in July last, with observations on the applicability of steam cultivation to the soils of Suffolk, by Mr. W. Raynbird, of Hengrave, and Mr. W. Syreitt, an engineer, of Bury St. Edmunds. The first part of this pamphlet is a *resumé* of the history of steam cultivation as given in Mr. James Howard's excellent paper read before the Farmers' Club, Mr. J. A. Clark's prize essay, 1859, and other publications on the subject; bringing the history down to the present time, with a reference to the successful efforts of Mr. Smith, of Deanston, Mr. Allen Ransom, and others, to perfect the machinery for steam culture. The agriculturists of the East Anglican counties have been rather backward in the application of steam to the cultivation of their fields, the cause of which we shall presently allude to. But Mr. Kersey Cooper, of Euston, Mr. Chambers, of Colkirk Hall, Fakenham, and a few others have adopted it with great advantage on their large fields, at a cost of from 3s. 6d. to 7s. per acre, exclusive of wear and tear, which would add considerably to those charges. Mr. Raynbird estimates the average cost of cultivating light land at 4s. per acre, and at the rate of ten acres per day; whilst on heavy land the cost is about the same as that of horse-power, with the advantage of the work being done more quickly and far more efficiently. This latter we look upon as one of the greatest recommendations of steam cultivation, the beneficial effect of deep culture, which can be efficiently performed *only* by steam power with ease and economy, being now fully appreciated after the experience of a year or two of drought, during which the deeply-tilled lands, by facilitating the supply of moisture by capillary attraction, carried the crops through unscathed, whilst on the shallow-ploughed lands they succumbed. There is no mistake about this fact, as every one conversant with the subject can testify to its truth. It is again proposed to form companies in Norfolk and other parts of the country for the promotion of steam cultivation.

From the report of the trials, it appears that three sets of implements were at work, namely, Fowler's double-engine system, drawing alternately the implement between the two opposite headlands; second, Mr. Howard's cultivator, windlass, and tackle on the roundabout system; third, the clip-drum system with single engine and patent anchors (on Fowler's principle), made by Burrell, of Thetford. The respective prices of these different apparatus are stated as follows: Fowler's from £1,082 with 8-horse power, to £1,402 with 14-horse power and double speed; Howard's, with 10-horse power engine, and all tackle complete, £520, or with 12-horse engine £580; Burrell's implement with all the apparatus complete, with 8-horse power engine £693, 10-horse ditto £759, and 14-horse ditto £850. The extra cost of Fowler's apparatus consists chiefly in the employment of two engines.

The field in which the trials took place was a light gravelly soil with a chalky conglomerate subsoil; the crop a trifolium layer on a wheat stubble. The three competing systems got upon the ground at 10 a.m. on Thursday, the 5th July. Fowler's got to work in ten minutes, and finished its 5½ acres with the cultivator at 25 minutes to 1 o'clock, which was rather over 25 acres per day, being a trial of speed. The depth cultivated was from 10 to 11 inches, and the work was performed in a masterly manner. The cultivator covered 6 feet. After finishing the allotted task Fowler exchanged the cultivator for ploughs, and completed 1 acre by a quarter to two o'clock.

Howard's apparatus, which required men and horses to set it to work, took an hour in preparation. His cultivator worked 7 to 8 inches deep, and broke up the ground thoroughly and rapidly when well in work; but neither Howard's nor Burrell's proceeded so fast as they would have done in ordinary work, wishing to make the small quantity of land allotted to them last over the two days' trial.

Burrell worked a three-furrow balance-plough on Fowler's principle; but it neither cultivated so deeply nor so rapidly as that used by Fowler.

On Friday, the 6th, Fowler began early by harrowing part of the land cultivated the day before, with a harrow covering 15 feet of ground. And at 10 o'clock he commenced ploughing for the Champion Prize, and cultivated across the horse-ploughing of the previous day. The implement worked steadily at a depth of 10 inches, across ploughed land and the unploughed balks between, which severely tested the power and efficiency of the cultivator. He next gave a specimen with the steam-plough, 7 inches deep, and parallel with the work of Ransome's champion ploughman. Fowler's work laid the furrows close and perfectly straight.

Howard's apparatus got to work a little after 10 o'clock, and, having finished their lot, began cultivating a piece of ground parallel to Fowler's, affording the spectators an opportunity of comparing the most efficient examples of horse ploughing, steam ploughing, and steam cultivation, ever exhibited in such close contact.

Burrell worked his apparatus with one of Fowler's seven-tined cultivators. The trials were concluded by 2 p.m. on Friday.

The extent of land ploughed and cultivated was 21a. 1r. 20p.—namely, Fowler's 9a. 3r. 20p., Howard's 6 acres, Burrell's 5a. 2r.

The question how far steam cultivation is adapted to the agriculture of Suffolk has been very fairly put, at the conclusion of the report. In the first place, a Suffolk ploughman, with a pair of horses, can easily plough an acre a-day, at the expense of 8s. 6d.; and where the soil is lighter, a still greater quantity. Secondly: The light soils have no staple or depth; the heavy ones are too wet, and the inclosures too small, and too much encumbered with hedge-rows and trees, to render it profitable. They would require thorough draining, and a completely new arrangement of the fields to prepare them for it. This is the work of the landlords, especially where no leases are granted; and the owners *will not* effect such improvements for two reasons—first, because of the expense; and secondly, because the change would destroy the harbour for game, and thus injure the sporting. It is therefore a hopeless thing for the Suffolk farmer generally to use those modern improvements on which the future prosperity of agriculture most certainly depends.

We were speaking a few days since with the son of a Suffolk farmer, who stated that part of the farm would not grow wheat. We asked why his father did not lime or marl it. "Oh," he replied, "he has no lease, and is eaten up with game. After wheat-seed, he is compelled to employ men night and day to keep the pheasants off the fresh-sown wheats; as he is also while the wheat is on the shock at harvest." The Suffolk men, however, see land in the distance. "It is probable," says the report, "that the gradual spread of steam cultivation will take place in this wise: Young men entering large farms, or a few neighbouring farmers will unite in the purchase of a steam engine for thrashing. Their men becoming competent, they will obtain tackle, such as Howards'; and, as their confidence in the system increases, the most powerful and expensive systems will come into use."

THE AGRICULTURAL GANG SYSTEM.

The Report of the Children's Employment Commission, begins by stating that this system is confined almost exclusively to Lincolnshire, Huntingdonshire, Cambridgeshire, Norfolk, Suffolk, and Nottinghamshire. These gangs are not found over the whole of any of these counties, but are distributed irregularly through various parts of them, in obedience to local circumstances. An organized agricultural gang consists of—1, the gangmaster; 2, a number of women, young persons of both sexes between 13 and 18, and children of both sexes from the age of 6 to 13. The most common, because the most manageable number in a public gang, is about 20. In addition to the "public gangs" there are also many "private gangs." The "public gang" master is an independent man, who engages the members of his gang, and contracts with the farmer to execute a certain kind and amount of agricultural work with his gang. The "private gang" is a small gang, seldom exceeding 12 or 20, similarly composed, but in the farmer's own employ, and superintended and directed by one of the farmer's own labourers. The Commissioners estimate the number of persons employed in public gangs at about 6,400, the majority of them females, and a very great majority of both sexes (but especially of males) being under 18 years of age. In some parts their origin may be clearly traced to the reclamation of land for cultivation under the stimulus of the high price of corn during the great European war, the consequent demand for labour, and the unwillingness of landowners to build cottages to meet it, owing to the operation of the law of settlement. Hence "open" parishes became over-populated centres, from whence farms for many miles round drew their extra, and in many cases their ordinary labour. The gang system seems to have sprung up naturally enough under these circumstances. The Commissioners proceed to state that in a small number of instances the description given in the evidence of the general character of the public gangmasters was favourable; in the rest it was very much the contrary. The public gangmasters are usually described as men whom the farmers are not willing to have in their regular employ, men who belong to the class of "catch-work labourers," in most cases men of indolent and drinking habits, "and in some cases men of notorious depravity," as a rule unfit for the office they undertake. Their influence is represented as very pernicious to the moral principles and conduct of the children and young persons of both sexes under their management. They are very rarely men capable or desirous of exercising a beneficial influence over those under them, whether while they are at work or on their way to and from their work, at which latter time the absence of all moral control is universally recognised as especially injurious. The gangmaster is engaged with his gang more or less during the greatest part of the year, although continuous employment for young children seldom exceeds six months. The work varies with the different months, but consists principally in weeding corn and other crops, picking twitch, singling turnips, setting potatoes, picking stones, spreading manure, topping and tailing mangolds and turnips, and other work of the like kind. Sometimes he is paid by the day, but generally by the piece. At best, his net earnings, after paying his gang, are small, being little more than those of the common labourer in steady employ. His "principal source of gain" is piece-work, which seems essential to rendering his trade a profitable one. In executing work by the piece his vigour as a taskmaster comes into play, and he makes his profit "partly by pressing his gang to the utmost of their strength, and partly by a hasty and imperfect performance of his work." Although the evidence does not disclose many instances of the use of personal chastisement to the children, it is everywhere apparent that the vigilance and energy of the gangmaster are continually exerted to keep the children, and also the women, up to their work. Hence the different members of the gang, especially the children, are often subject to an excessive amount of labour and other hardships. The usually low moral character of the gangmaster is naturally reflected in the ordinary composition of his gang. The "characteristic type" is described as being given to it by the presence among the young or adult women belonging to it, of those who have forfeited their chance of better employment, or whose habits are coarse and irregular. With these are youths who have probably been brought up in the system from their tenderest years, who have therefore lost all opportunities of early instruction, and who have been hardened by early associations with vice. These may be said to compose about one-half of each gang. The remaining half consist of children and young persons of both sexes, from the age of 6 to that of 18—many of them children of respectable labourers and others, who are quite conscious of the pernicious consequences to their offspring of such association, and who in many instances allow them to be subjected to it with the greatest reluctance. On the other hand, "it is too often the practice for parents to make the employment of their younger children the condition on which the gangmaster may have the older ones." Some instances are recorded in the evidence of children as young as 6 years being or having been employed in these gangs. Considerable numbers of them are shown to be thus employed at the ages of 7, 8, and 9. Their hours of work are in some places from 8 a.m. to 6 p.m. in summer and to 5 p.m. in autumn, in others from 5 a.m. to 7 p.m, including the time occupied in going and returning. Under other masters the time of actual work is about eight hours. The distances to which these young children, together with the rest of the gang, go to their work, sometimes amounts to five, six, or even seven miles. In such cases the journey to and fro must entail on the children three or four hours' additional labour, even supposing the time spent in the field to be reduced by one or two hours. In very rare instances they receive assistance in the way of conveyance, for either a part or the whole of those distances, from carts or waggons sent for them, or donkeys provided by the gangmaster, on which the smaller ones may ride by turns. The interest of the gangmaster leads him to keep the whole of his gang at full stretch while at their work, with the shortest possible intervals of interruption. When to this is added the length of the walk to and from their work, it will be evident that this mode of employment must impose upon the young and the feeble a vast amount of fatigue, often to the point of entire exhaustion. To those of the strongest constitution among the boys and youths this may be attended with no permanent ill effects; but in the opinion of medical men, and of other competent observers, it often lays or developes the seeds of illness and premature decay in those of weaker frame. In the case of the girls there can be no doubt of its injurious tendencies and results in a physical point of view in very many instances. The evidence contains such examples as these: A labourer's wife in Huntingdonshire says, "My daughters, aged 11 and 13, walked eight miles each way every day, besides working from 8 to 5. They used to start at 5 in the morning, and seldom got back before 9. They had 7d. a day, but found their own meals and their hoes." A woman says, "You see the big ones come dragging the little ones home, and sometimes taking them on their backs when they are overtired." A mother says of her boy that he had been six miles and further to work, and had come home so tired that he could scarcely stand; and that they had also had to send out late in the evening to look for him as he did not come home, "and had found him dropped asleep in a cow-shed." A boy, five years old, used to be carried home from his work by the others. Of the bad moral results from the intermixture of the sexes in groups of the kind described, under no proper control, and receiving their general impressions from a nucleus of characters already corrupted, the testimony is universal. The unanimity with which the public gang system is condemned, in consequence of its injurious influences on the moral character of those subject to it, is all but entire throughout the whole evidence. The number of persons who are able to speak well of the system under its moral aspects, as far as they have witnessed it, is very small indeed. The rest, with an earnestness of expression which testifies to the sincerity of their convictions, are evidently deeply impressed with the desire to call attention to the great amount of moral evil connected with the system, and to urge the consideration of some mode of improving it. It is satisfactory to find from the evidence that the desire to apply a remedy to the evils of this system is as widely felt and as decidedly expressed as is the condemnation of the system, and that there is a very general concurrence in the leading outlines of the remedies proposed. The Commissioners, after considering the suggestions made by a large number of gentlemen, of various occupations and positions, in many different localities, make the following recommendations: First, they recommend that every public gangmaster be required to obtain a licence from the Petty Sessions, producing to the magistrates a certificate of character from three householders, two of them to be guardians of the poor, and satisfying the magistrates of his fitness to be intrusted with the management of children. The licence should be annual, and revocable for misconduct, and the gangmaster should bind himself to pay the wages by a certain hour, and not in a publichouse, and not to employ any young person incapable of the work without undue strain or suffering. He should also undertake to preserve orderly and decent conduct in his gang. Next, the Commissioners recommend that no boy under eight, and no girl under twelve years of age should be employed in a public gang; but in regard to children above those ages, the commissioners are of opinion that any legislative regulations should be of such a kind as to allow of their being adjusted to the special circumstances of each locality, and that a discretionary power should be left to the magistrates granting the gangmaster's licence, to determine at what age children may be thus employed, and to endorse the licence accordingly. The commissioners further recommend that it should be enacted that no boy between the ages of eight and ten, and no girl below the age of thirteen, should be allowed to be taken to work in a public gang a greater distance than one mile from its home, and that in regard to boys above the age of ten, and young persons, it should be in the discretion of the magistrates to adopt any distance within certain limitations, in reference to age, that they may deem most suitable, and to endorse the same on the licence. The commissioners are also of opinion that no child should be employed in a public gang longer than eight hours in one day, including the time occupied in going to and returning from work, and one hour for rest and refreshment after the first 3½ hours; and no young person for longer than twelve hours in one day, including the time occupied in going to and returning from work, and one hour for rest and refreshment in the middle of the day. It is strongly and uniformly insisted upon throughout the evidence that whenever females are employed in public gangs they should not be allowed to work in the same gang with males, unless subject to some regulation. At the same time it is made evident by abundant testimony that, injurious as work in the fields in the public gangs is to female delicacy and morality, more injury arises to both during the times of going to and returning from work. It would clearly be most desirable, in the interests of morality, that whenever it should be found possible, without any serious inconvenience to the processes of agriculture, to exclude females altogether or young females above the age of 13 years from the employment in the public gangs, a discretion proposed to be given to the magistrates to do so should be exercised. But where it should be thought expedient to permit the employment of females in these gangs, the Commissioners are of opinion that the magistrates should be empowered to order that, if any male person above the age of 15 be employed, it should be unlawful to employ any female above the age of 13 in the same gang, unless a female superintendent, licensed by the magistrates, be engaged, herself working with and as one of the gang. Where the gangs are small in number, and subject to much fluctuation in the times and places of employment, such an arrangement would be too onerous to enforce. But where the system is fully organised and the gangs are in constant and regular employ during large portions of the year, it does not appear that it would impose any undue restriction upon the gangmaster. Among the causes of suffering most earnestly complained of by the female witnesses who have worked in the public gangs is the practice of being taken into high wet corn for the purposes of weeding. There can be no doubt that the practice inflicts much physical hardships, and is injurious to female delicacy. The Commissioners recommend a protection to females in this particular similar in principle to a clause in the Factory Act of 1844. Lastly, in regard to school attendance, the Commissioners consider that where the demand for child labour is continuous, or nearly so throughout the year, and where children are abundant to supply the demand, the half-time system might be enforced; and where the demand is intermittent, advantage should be taken of the intervals, and the magistrates should have a discretion, therefore, to impose regulations in granting the gangmaster's licence. But the Commissioners hold to the principle that the moment a child begins to earn wages, a small but definite percentage of the child's earnings should be devoted to the high and essential object of its education. The Commissioners address themselves to the objection which will be raised by some employers to legislative interference with a system which supplies them with cheap labour. It is thought possible that such interference may raise the price of common gang labour, and therefore tend to the gradual abandonment of the system of public gangs. The Commissioners observe that should the gradual abandonment of the public gang system be the result of the legislative interference proposed, the entire evidence proves that such a result would be in accordance with the best interests of the labouring agricultural population now subject to it. The system does not appear to be anywhere in the eastern counties (where alone it is found) more than 60 years old; in some localities it has not existed more than 30 years. It is the direct result of the pulling down of cottages in "close" parishes to avoid poor rates, and of the formation, by the inclosure of wild land or otherwise, of large farms, without providing an adequate number of cottages to contain the workpeople required to supply the demand of labour for the farm. It is not to be believed that any landowner who, either in the past or present generation, was led to adopt that policy in regard to the distribution of agricultural labour could have realised the amount of physical hardship, of unnecessary fatigue, imposed by it on the old and young, on the strong and the weak, from day to day and year to year, at all seasons and in all weathers; still less could he have anticipated that the absence of a proper distribution of agricultural labour would have given rise to a system which has increased to so great a degree the temptations to and opportunities for moral evil to several successive generations of the young of both sexes in the localities where it exists. The alteration in the law of rating effected by the Union Chargeability Act of 1865 has happily put an end to the inducement which led in so many instances to the pulling down of cottages and driving the rural population to a distance from the land which they cultivated. It may be expected that by degrees sufficient cottage accommodation will now be provided on each farm. The good economical, social, and moral effects arising from the fulfilment of this duty are strongly pointed out by various persons of authority and experience in the course of the evidence. If one of the results of placing the public gangs under salutary legislative regulations should be to diminish the disposition of the gangmaster to form them, and thereby to supply another motive for the proper distribution of agricultural labour in suitable cottages upon the land, it will contribute greatly to the just satisfaction and to the happiness and well-being of the labouring poor in these districts, and be no less advantageous in an economical point of view to the employer, in the saving of time and strength now thrown away in going and returning long distances to and from work. All that time and strength wasted; all the suffering from extra and unprofitable fatigue produced to the labourer and to his children; every instance in which the parent may have traced the moral ruin of his child to the undermining of delicacy by the overcrowding of cottages or to the contaminating influences of the public gang, must have been so many incentives to feelings in the minds of the labouring poor which can be well understood, and which it would be needless to particularize. They must be conscious that much bodily and mental pain has thus been inflicted upon them from causes for which they were in no way answerable; to which, had it been in their power, they would have in no way consented, and against which they were powerless to struggle. Every measure contributing to cause proper cottage accommodation to be distributed according to the need upon or near the land to which the services of the agricultural labourer and those of his family are applied must, as far as it reaches, have a most salutary effect in tending to allay such feelings and be in many other respects a great public benefit. But a very small proportion of the young engaged in agricultural labour in the counties to which this report refers will be reached by any measure that applies to the public gangs only. The return and evidence give a number of between 6,000 and 7,000 children, young persons, and women employed in the public gangs at the time of the inquiry. The total was probably somewhat in excess of that number. To these the attention of the Commissioners, according to the instructions, has been primarily, and almost exclusively, directed. But the Assistant-Commissioners in the course of their inquiries could not fail to observe, and could not decline to hear, much relating also to the private gangs in the occasional employ of individual farmers. The aggregate number of children, young persons, and women occasionally employed in the private gangs throughout these counties is greatly in excess of those employed in the public gangs. Where the numbers of the latter "are," to use a common mode of designating them, "counted by hundreds, those in the former are counted by thousands." It seems to be a generally and necessarily prevailing practice wherever the farms are large in these counties for the occupier to employ at certain seasons either a public or a private gang. How large must be the numbers employed in the latter manner may therefore be inferred when the prevalence of large farms throughout these counties is borne in mind. Such evidence as the Assistant Commissioners have recorded concerning these private gangs tends to show that in their moral effects upon the young they are very little distinguishable from the public gangs. They are superintended by one of the farmer's own men. There is much testimony to the fact that the treatment of the young in the private gangs is occasionally not so good as in the public gangs. It appears to be frequently quite as bad. Where the sexes are mixed, as is almost always the case, the results are quite as demoralising as in the common gangs. It appears that the casual superintendent of a private gang is often a man less capable of exercising control than a regular gangmaster, and is sometimes a man of bad character. There is no security that he should have any of the qualities required to maintain order and decency among those assembled under him. Some employers have endeavoured to separate the sexes in the private gangs, and to limit the age at which they would admit children to work in them; but these efforts were for the most part unsuccessful, for want of the requisite support, or the means of enforcing their regulations. The evidence shows that there is no practical difference between the ages and hours of work, the modes of work, the composition of the gang, the state of education, and the moral condition, in the case of those employed in the private and the public gangs.

The Assistant Commissioners have also incidentally called attention to the large number of children in the same districts who, although not employed either in public or in private gangs, are taken at the earliest possible age (between six and seven years of age and upwards) to work in some department or other of agricultural labour, from which period their opportunities of school attendance almost entirely cease. They specify, in particular, the very large number of children of very tender years sent into the fields to "keep crows" or drive small birds from the crops, to look after cattle, or to perform other services not requiring much bodily strength. It would appear that these latter children, as well as those employed in the private gangs, equally demand the attention of the State, and are in as much need as those employed in the public gangs of some legislative measure for their protection from an unreasonable amount of work, and for their education. This question was touched upon in a report "On the Employment of Women and Children in Agriculture," addressed to the Poor Law Commissioners, and laid before Parliament in 1843. But the inquiry upon which that report was founded, under the instructions of the Secretary of State, was, in accordance with sec. 2 of the Act of 5 and 6 Victoria, cap. 57, confined to the short period of 30 days. It necessarily, therefore, embraced only a portion of the subject, the brief inquiries being confined to the counties of Norfolk, Suffolk, Yorkshire, Northumberland, Wilts, Lincolnshire, Dorset, Devon, Somerset, Kent, Surrey, and Sussex, and led to no result. The evidence recorded by the Assistant-Commissioners on the private gangs and on the other branches of agricultural employment for children was necessarily very limited, as being only received incidentally to the main object of their inquiry. Upon that evidence and upon the wider branches of the subject which it opens up, the Commissioners did not feel called upon to express an opinion, as being beyond the scope of their instructions.

A NEW FARMSTEAD.—A large farmsteading, arranged for a system of feeding cattle entirely under cover, and carrying on all indoor farming operations under the same roof, has just been completed at Grinkle Park, Yorkshire, for Mr. Charles M. Palmer. The building may be described as forming a hollow square, covering nearly half an acre of ground, the centre of the square being occupied by the feeding boxes, twenty in number, each ten feet square, and sunk three feet below the surface; the roof rises high over this portion and is supported by thirty metal columns. Around this centre are arranged the following departments;—commencing on the north side with the barn and the thrashing machinery (supplied and fitted up by Mr. William Trotter, of Stocksfield), with engine house, smith's shop, spacious straw house, implement house, cartsheds, &c. On the west side is a range of ten stalls for the farm horses, with harness compartments for each horse; and behind these again, ranges of loose boxes for brood mares, with hay-house and corn-stores, &c. On the south side are a large fold-yard for the store cattle (open by archways to the south), pig-house, bull-house, &c. On the east side is provided accommodation for the milk cows, and calf-pens, boiling house, oil-cake store, turnip house, &c. The patent metal fittings in the stable, loose boxes, byre, and cattle boxes, have been procured from Messrs. Musgrave and Co., Belfast, each animal having a separate trough for water, supplied through a system of pipes, and of which there is a never-failing supply (of pure spring water) at a high presure. The system of cemented passages throughout the building, in connection with storehouses, and the use of small rolling waggons for the purpose of carrying the food, enable the feeding operations to be carried on with the most economical employment of labour. The lighting and ventilation of the building which are mostly effected in the roof, are quite successful, as well as the system adopted for collecting and saving the manure, both solid and liquid. The stackyard stands to the north of the buildings, adjoining the barn. At the west side, at a short distance from the building, a semi-Gothic house has been built for the farm-bailiff, to which is attached a roomy garden; and on the east side are six new cottages, of four rooms each, with gardens in front. The architect is Mr. Archibald M. Dunn, of Newcastle-upon-Tyne; and the buildings, including machinery, have cost about £4,600. The contractor for the whole of the works is Mr. Thomas Linfoot, of Whitby; and Mr. John Dixon acted as clerk of the works.—*The Builder*.

THE CONDITION OF THE LABOURING CLASSES.

Putting for the moment the cry for Reform altogether out of the question, there can be no doubt but that the labouring classes are gradually reaching to a very different position in this country to that which they have hitherto held. If, for some time past, we have not been living in an atmosphere of Strikes, there has still been a deal of conference going on between Master and Man. Nor is this to be wondered at. A variety of circumstances has tended to raise both the prices of provisions and lodging—in the large towns more particularly—and the artisan has found his comforts proportionately diminish. A Strike is at best but a bad argument, and it is creditable to all concerned that the outside world has heard so little of the adjustments which have lately been arrived at between the Employer and the Employed. Indeed, we have had recently to go further afield for any such demonstrations, and the action taken by the engine-drivers and farm-servants has naturally created more attention from the movement being organized amongst men who, so far, had not availed themselves of such a means to an end. In harvest-time, certainly, we have, ere now, seen a gang of strangers—navvies and such like—throw down their hooks and forks, and refuse to go on, unless with more money and more beer. But, at a slack season, it is something very exceptional to see the labourer putting himself out of work, unless he went straight from the homestead to the Union, when finding it impossible to keep his family on the wages he received. Now, however, a secretary is engaged, a fund is formed, and the men lie by until they have obtained their "just rights." At the same time, there is fortunately an alternative. If men cannot earn twelve shillings a-week in Buckinghamshire, there appears to be every opportunity of their doing this elsewhere, and thus, according to the treasurer, "from the funds already subscribed, many of the Gawcott men and their families have been assisted to remove to other counties, where better wages are paid." And here, thanks to the new Settlement Act, carried by Mr. Villiers, is some solution of the difficulty. It is awkward enough to have hundreds of bricklayers or mechanics idling about until their demands are acceded to, or their return to work authorized by the acting committee; but with the agricultural labourer the course of proceeding is much more simple. If he cannot obtain all he wants here, he may elsewhere; and the sooner he removes the better for everybody. How this can be done was strikingly shown in a speech of Canon Girdlestone's that we give in our present number: "When I first came to Halberton, I found that the wages of an able-bodied, industrious married labourer were only 8s. and in some cases but 7s. a-week, out of which, with a few exceptions, house rent, fuel, food, and clothing, and medical attendance, for self, wife, and children—in short, everything—had to be paid." And how did the Canon essay to improve the condition of his parishioners? Plainly by getting rid of them. "By my instrumentality no less than thirty-eight labourers from this neighbourhood—about half of whom are married, with families, and half single men—have been removed to various places—Ireland, Lancashire, Yorkshire, Essex, and Kent, where the married men all get house and garden rent-free, with sometimes fuel added, with wages varying from 12s. a-week the lowest, to £1 a-week; and the single men mostly board, lodgings, washing and mending, and 6s. a-week. This is still going on; I have still applications both from and for labourers." The applications from either side go far to prove the practicability of the plan, while it is very noticeable that the minimum advancement given by Canon Girdlestone is that for which the Gawcott men held out. In Devonshire the wages were seven and eight shillings a week, and in Buckinghamshire nine or ten shillings.

It is only fair, however, to say that this statement is denied. The argument on the part of the men having already been very generally circulated, it may be as well to hear what the employers have to offer in answer. Recently, then, there was the now monthly meeting of the Bucks Agricultural Association at Aylesbury, when Mr. Biggs read a paper on the Increase of the Poor Rates. In the course of the discussion, Mr. Woodman, though admitting that the supply of labourers was greater than the demand at Tring, denied the accuracy of the statement that the farmers were paying them nine shillings a week only, and declared that, taking the whole year through, their wages averaged fifteen shillings per week. Mr. Treadwell, again, referring to the strike at Gawcott, objected to the fact of the men receiving at the present time nine shillings per week being taken as a fair sample of their pay, inasmuch as this was an exceptional season of the year. In the summer months and during harvest-time they had much higher wages; and taking this into consideration, their average rate for the whole year round, as Mr. Sewell Read had stated in his prize Report on the Farming of Buckinghamshire, was at least thirteen shillings a week. Besides, many of the labourers had large families, and what with their children's earnings their income was not inconsiderable. Mr. Bennett even went so far as to say that the labourers were at this present time receiving not less than from eleven to fourteen shillings per week, while in the harvest time and throughout the summer months their earnings were not less than thirty shillings per week. There is clearly a great deal in such an explanation as this, for there is scarcely an income made by a man's own industry, whether the annual return be counted in thousands or hundreds, but that fluctuates at certain seasons of the year. Every one of us has his harvest and his bye-time; and it would be as unfair to fix a labourer's wages by what he can make during a frost, as a professional man's income by his earnings in the vacation. At any rate, the income-tax commissioners would scarcely be satisfied with such a showing. The labourer, as we are told, has seven or eight shillings a week, out of which he has to pay his rent, clothing, and so forth. But this is manifestly a fallacy. The man does not pay his rent out of the eight shillings, but from the better wages he receives during the hay and corn harvests. Even when the Law of Settlement was in full force, men would go out on the tramp, as it were, for weeks and months together, taking the highest rates as they moved from place to place, as the corn became fit, and then returning home to winter. Now it seems they can be removed, root and branch, to districts where "regular" wages vary from twelve shillings to a pound the week.

The condition of the labouring classes is, we repeat, undergoing a gradual change, and it is as well that the farmer should keep his eyes open to this fact. His point should be to retain good men about him, and in doing so, though the rate of wage may be a great deal, it is not everything. More attention must be paid to the workman's comforts, and the landlord here must give a helping hand. Instead of making it his business to pull down cottages, he must build them up again. Only let the man have a chance of becoming attached to his home, and he will be as loth to leave it as an Englishman proverbially has been. In plain truth, this is becoming more and more a matter of associated interest, and, according to our Derbyshire report, some employers are already becoming despondent over the competition to which they are subjected in the labour market: "Wages bear no relation to the past; and the more you give, the more independence is shown by the employed. We are losing caste, and have to crouch to be served. The enormous demand for hands at our iron-works and coal-pits puts the farmer entirely into the shade, and any half-handed youth gets his 3s. to 5s. per day; and where there is a father with his big lads, the income requires the inspection of the Chancellor of the Exchequer, £100 per annum being nothing. We are glad it is so. But what can the farmer do, with those wages and an exhausted arable soil? The returns would not pay wages, were there no rent in question. We have several farmers in the parish where we write who cannot get nor keep a servant in the house, and what labour they do get is at a very high rate—a *mining rate* is the term. The consequence is, hedges and ditches and lots of labour go undone." Surely here is an exodus for the Halberton and Gawcott operatives.

A BOARD OF AGRICULTURE.

"It appears to me that a discussion on the desirability of a Board of Agriculture as a Government department must be very opportune just now, in consequence of a Central Chamber of Agriculture having recently been formed, with various local Chambers throughout the country. These increasing bodies scarcely know to what member of the Government to apply in case of need; and, at the same time, they feel that if left to Parliament generally they will be trusting to a broken reed." So said the chairman of the Farmers' Club the other evening, and so will say many more who have any experience of the public life of agriculture. Indeed, the establishment of some official organ with which to communicate would seem to be amongst the first objects of the new Chamber. Anyone who has ever been concerned in bringing any agricultural matter under the attention of the Government must remember the almost ludicrous uncertainty which has prevailed as to the proper quarter in which such a question should be pressed. It may be the Home-office, the Board of Trade, or some other department; and when the right office has been selected, and the interview conceded, it has been as amusing to see how little the Minister really knows of the business. The main refuge of any such right honourable gentleman must be to put people off, and we really believe that one of the reasons why agriculture has made so little headway in Parliament is that no one is appointed to deal with such an interest. At best this ranks as only incidental to the discharge of some more specific duty; and whilst cities are pushing their Bills through, and manufacturers maintaining their Rights in the House, the farmer must be content with some chance answer to his application, or some vague promise that is forgotten almost as soon as it is given.

As Mr. Sewell Read said, in by far the most effective speech of the evening, "in foreign countries the Government did everything, and the public nothing; in our own country, on the contrary, the public did everything, and the Government next to nothing." And Mr. Read, be it borne in mind, speaks with especial authority here. He, more than any other man ever has done, represents the farmer in Parliament; and he must feel accordingly how little thought is bestowed upon the class he comes from. Not, however, that the want of such a Board is so generally admitted as might have been imagined even by the leading members of the Central Chamber. Mr. Pell, the chairman, scarcely commits himself to the necessity of any official recognition; Mr. More, the vice-chairman, has declared himself more decisively against the establishment of such a department; and the correspondent of a cotemporary anticipated the consideration of the question in a paper wherein he betrayed his manifest anxiety lest a Board of Agriculture should interfere with or usurp the place already occupied by the Chamber of Agriculture. As we have already intimated, one should really be but the consequence of the other, as if there be any call for a Chamber to fashion the claims of agriculturists, there must be equal need for a Court where these claims may receive all becoming attention. As it is, our advance is but half way, and the point of the story fails where its effect should gradually culminate.

Not but that the proposal for establishing or re-establishing a Board of Agriculture is associated with some difficulties, and foremost amongst these is the collection of Statistics. We may take it for granted that if such a Department were instituted, some more general system for obtaining returns from occupiers would be organised. And here the farmers straightway become a divided house, as indeed the Club discussion very fairly represented the feeling of the country over this matter. Sir George Jenkinson, for instance, thought that amongst "many subjects of great importance with which a Board of Agriculture might fitly occupy itself was the collection of Agricultural Statistics;" Mr. Smythies maintained that "the collecting of Agricultural Statistics would be for the benefit of the Agricultural interest;" and Mr. Duckham thought "there would be great advantage in knowing the acreage of planted corn." Whereas Mr. Nash "did not think any one had a right to come upon his farm to ascertain what he grew;" Mr. Gardner considered that the information obtained from statistics would benefit the corndealers and not the farmers; and the chairman, Mr. Little, had "long held the opinion that Agricultural Statistics would give the merchant a very great advantage over the farmer." Under these circumstances—and the same difference exists even in the Council Chamber of the Royal Agricultural Society—it might be well to pause but for a well-known fact that we have had occasion to dwell upon during the last few months. Sir Stafford Northcote, the President of the Board of Trade, has declared that he sees no necessity for a separate Board of Agriculture, although he is especially desirous of obtaining Agricultural Statistics. Should, then, the present Government remain in office, the probability is that whether the formation of a Board be pressed or not, the returns from farmers will be required, and on some more comprehensive scale than has ever yet been attempted. The other side of the House it is said would be ready to go for both the Board and the Statistics, but after last Friday night's division Sir Stafford may have ample time to develope his scheme, so that it may be only prudent to stand prepared, and be ready to ask what he will give in return for the advices he seeks?

The uses of such an office would be almost infinite, and in truth the outbreak of the cattle plague should be enough to warrant its creation. As one of the speakers at the Farmers' Club said, had there been a Minister of Agriculture when the disease first made its appearance "many thousands of pounds would have been saved to the country." But for lack of such a Minister, we were fain to fly to temporary Commissions and similar agencies, without exactly any head or order, as Lord Robert Montagu has very recently admitted that he has been so harassed with the cattle-plague and "other things" that he has really had no time to attend to what his Lordship clearly considered the more immediate business of his department. Had there been such a Board to deal with, the withdrawal of the cattle-classes from the approaching Shows might have been made a matter of more deliberation than appears to have been the case. As it is, a deputation has an interview with one member of the Government, while another briefly announces in the House that "considering there were five places in England affected by the cattle-plague, it was thought not advisable to alter the Order in Council of the 24th of March, 1866, so as to allow of exhibitions of lean, not fat stock, during the present summer. That Order in Council, however, applied only to cattle, not to sheep and other animals." One of the great features of these meetings is thus again disposed of, we will not say altogether unadvisedly, although the prohibition will come like a thunder-clap on the country, where, with the sales on, the markets opened and the prize-lists issued, the entry and exhibition of stock had been in a great measure taken for granted.

From the opening paper of Mr. Nockolds onwards the tone of the discussion at the Farmers' Club was very much one way, or as Mr.Read put it, "if all that had been done or attempted to be done were placed under one department the agricultural community would be much benefited, so that in the end something good would come out of that evening." If there were any exception, this was of a very ludicrous character, with a man apparently irritated at the idea of any one but himself receiving a salary from an agricultural institution! Of course, there are people who are occasionally employed to talk up or write up embryo undertakings under the promise of appointments or with some more direct payment for their disinterested services; but as there is manifestly no such "motive" influencing those who advocate the establishment of a Board of Agriculture, we are inclined to regard any argument in favour of the proposal as pure and trustworthy.

REVIEW.

PHYSIOLOGY AT THE FARM IN AID OF THE REARING AND FEEDING THE LIVE STOCK. By William Sellers, M.D., F.R.S.E., &c., and Henry Stephens, F.R.S.E. *W. Blackwood and Sons, Edinburgh and London,* 1867.

The authors of this book are well known in their several spheres of life for the authority they may claim for the correctness of their views and experiments. The one as essentially a man of science, and the other as a practical farmer working on scientific principles, have each gained a niche in the temple of literary fame, and the present work is not likely to detract from their claims.

A work on physiology in the last century would have been a sealed book to 999 farmers out of 1,000; but a new era has dawned upon the profession, and hundreds of the rising generation of husbandmen have qualified or are qualifying themselves for pursuing their calling on the principles developed in this book. We shall see in future the triumph of Science over empiricism in both the cultivation of the soil and the feeding of live stock. This triumph has already been to a certain extent achieved; but much still remains to be effected, and much prejudice to be surmounted, before either the land of England is raised to the highest pitch of production, or the cattle and other animals are generally reared and fed upon the principles laid down by our authors.

The book is divided into three parts: The first gives a detailed description of the organs of nutrition and their mode of action on quadrupeds, as the ox, horse, sheep, pig, and dog, and on the chief kinds of poultry. The second gives an account of the chemistry of food in the animals referred to, and of the specific nutritive value of each article, so far as has been ascertained. Part the third is an attempt to show the theoretical grounds on which the agriculturist must proceed in determining from his knowledge of preceding facts in physiology and chemistry the kind and amount of diet more or less necessary when special circumstances arise; and to ascertain how far the established usages of the farm in respect to animals harmonise with the precepts of the sciences of physiology and chemistry.

Unlike most of the works on scientific subjects, our authors pass over all merely speculative or less important branches of the science, and come directly upon that which is practical in the immediate object in view. This is evident in the first part in which the action of the animal organism for the appropriation of food, such as mastication, deglutition, rumination, &c., &c., are clearly and fully treated of. The wonderful chemistry of the stomach, the apparatus by which its functions are performed, the selection of the useful and essential and rejection of the non-essential parts of food; the anatomical distribution of the various organisms of the body and their separate functions; the difference in the internal structure of the carnivorous, the omnivorous, and the ruminating animals; the modes of action of the stomach on food, and of food on the animal frame; in short, the whole routine of the internal economy of the animals of the farm, as regards the appropriation of food and its effect on the system, is described and explained in familiar terms, the more technical words being explained in a copious glossary at the end of the work.

The second section—on the chemistry of food for farm live-stock—explains the nature of the various substances contained in the food, their several properties and effects in the fattening and rearing of animals, and in the separate formation of flesh, fat, bone, &c. Analyses of the different plants employed, and their comparative nutritive values ascertained thereby, are a valuable acquisition to the farmer. The following is a specimen of the style and manner of the work. After speaking of the fondness of animals for salt in all its forms, he proceeds: "But it is almost trifling to dwell on such exceptions as these; a more important, though almost purely speculative difficulty is involved in one of the statements made above, namely, that the food of plants is exclusively mineral. This, however, is the view which now stands nearly established. The food of plants consists of water, carbonic acid, ammonia, and certain earthy and saline matters. A great part of the carbonic acid which serves for the food of plants is derived from the atmosphere, and this portion of their food is undoubtedly in the mineral state. But plants also take in carbonic acid from the soil set free during the decomposition of organic matters therein contained; and the question which has been so much debated is—whether these organic matters in the soil, which manifestly are the source of food to plants, undergo complete decomposition [disorganization?] before being absorbed, so as to supply mere mineral carbonic acid to the radicles? or whether they are taken into the plant while still possessing an organic character, and are decomposed to supply food actually within the plant? The determination of the question in this particular form does not, perhaps, possess the importance usually attributed to it; for if the carbonic acid derived from the organic matters in the soil, whether set free in the soil before the absorption, or set free after the absorption of these organic matters within the structure of the plant, be decomposed solely in the leaves by the influence of the light, so that its carbon is then only fixed in the plant, the question is virtually settled; that is to say, the carbonic acid, whatever be its source, contributes to the process of vegetation only under the influence of light, and while [when ?] it has been reduced to a purely mineral state," &c. (page 287).

The third part is the most speculative and profound portion of the work, and embraces the "*Theory of the conservation of energy applicable to show the difference between the diet of an animal at rest and an animal under exertion*;" "*The effect of falling from a height on the temperature of a body*;" "*Application of foregoing views to the choice of food for the horse*," &c., &c. The elucidation of the first of these subjects involves a controversial argument on the views of Frankland and other physiologists, of the chemical and mechanical effect of food on the animal frame. This argument is contained in a very extended note, occupying the greater part of eight pages, to which we must refer the reader. This third part is entitled "*The application of the theory of nutrition to practical use in the farm*," and the argument goes to prove that the amount of work which a body is capable of performing is in proportion to the quantity of muscle-forming and heat-producing food taken. This is a subject which those farmers ought to study who think that a labourer with a wife and children can be supported in efficiency on 10s. a week! Men, as well as the inferior animals, require adequate nourishment to sustain their physical power.

We doubt not that this *first* work on the subject of physiology directly and exclusively applied to the farm will be of essential use to the practical man who has even a smattering of science. It is written in a clear, vigorous, and familiar style, but will require close attention to master its details, which such a study will amply repay.

COURT OF CHANCERY.

FRIDAY, MARCH 22.

(Before Vice-Chancellor Wood.)

WALKER *v.* GILLUM.

This was a motion for an injunction to restrain the defendant, Miss Sarah Gillum, formerly of Chichester, but now residing at Brighton, from proceeding with an action which she had brought against the plaintiffs, Messrs. Walker, of the Old Broyle Farm, Chichester, to recover damages for breach of covenant, and also the sum of £2,500 as a penalty for breaking up pasture-land, and £2,875 as over-rent for the same land. It appeared that in 1855 the defendant and her deceased sister, Miss Mary Ann Gillum, granted the plaintiffs a lease of the Old Broyle Farm, for 14 years, at the yearly rent of £135. By the lease the defendants were to lay down certain fields into pasture; and it was stipulated that if they broke up any pasture-land without consent, they should forfeit £50 per acre, and pay a rent of £5 per acre in addition for each acre so broken up. In 1858 Messrs. Stapley and Wonham, the lessor's agents, on being applied to by Messrs. Walker for permission to break up the land agreed to be laid down, assented thereto, and gave them a memorandum stating how the land was to be farmed in the year ensuing, the directions therein contained being inconsistent with the user of the land as pasture. The defendants ever since have used the land in question as arable land, paying their rent regularly, no complaint whatever being made by or on behalf of the Miss Gillums, or either of them, or any claim made for the forfeiture or over-rent. In 1865 the farm was sold to Mr. George Henty, of Chichester. In September last this action was commenced. In January last an order was obtained by the plaintiffs (defendants in the action) to deliver interrogatories to the defendant in order to a discovery of the time of the sale of the farm and other matters to assist them in their defence at law. The time for the defendant answering the interrogatories was twice enlarged, upon representations being made to the judge that the draft of the answers was ready, but the defendant was unwell; and if a few days' time was given, they would be filed. The extended time, however, expired, and the answers were not given in. The plaintiffs then applied for an order for the oral examination of the defendant, upon which it was stated that her health and faculties had become so impaired by age as to render her unable to understand interrogatories, or answer any questions relating to business and thereupon Mr. Baron Martin ordered that an attorney, to be agreed upon between the parties, should see the defendant, and take her examination, if competent, or state the fact if she was not. His lordship also ordered that the plaintiffs should plead to the action in a week, and take short notice of trial for the Sussex Assizes. The plaintiffs then filed their bill for an injunction, to restrain the proceedings in the action. After the filing of the bill, an offer was made on the part of the defendant to abandon the claim for damages accrued before 6th of November, 1865, the date of a letter from Mr. Henty's solicitors, requiring the plaintiffs to perform the covenants in the lease, on the bill being dismissed with costs to be paid by the present plaintiffs. This was declined on the part of Mr. Henty. All knowledge of the authority given for the breaking up the land was denied until the filing of the bill.

Mr. Kaye, Q.C., and Mr. Freeman (instructed by Messrs. Rogerson and Ford, agents for Mr. Albery, of Midhurst), now moved for the injunction.

Mr. Giffard, Q.C., and Mr. Woodruffe (instructed by Messrs. Robinson and Preston, agents for Messrs. Johnson and Raper, of Chichester), appeared for the defendant.

The VICE-CHANCELLOR: I think there must be an injunction in this case; but you must undertake to submit to such order, if any, as the Court may make at the hearing of the cause, as to damages or otherwise in respect of the covenants in the lease. I think it was a pity that the offer was not a little more extended than it was in the first place, that is, the dismissal of the bill with costs. The bill was a most justifiable bill, because it turns out now, as far as I can see, that the action was altogether unjustifiable, being brought in the name of Miss Gillum, and claiming on the part of the plaintiff no less a sum than £2,875, to say nothing of the £2,500 for forfeiture; because if there was a forfeiture there would have been a penalty for one forfeiture, and not an increased rental. There is a claim first for £2,500 by way of penalty of £50 an acre for fifty acres, and then there is a claim for £2,875 as a penal rent of £5 an acre during all the existence, or nearly the whole of the existence, of the term. Then as to that, it now turns out that this gentleman could not possibly sue in respect of anything more than the period between May and November. The most he could have sued for would have been only the forfeiture, and for half-a-year's rent, which, at £250 a-year, would, at the very most, have been about £125. That being so, nothing could be more unjustifiable than bringing an action in the name of Miss Gillum, and not disclosing any of these particulars, until it came to be necessary to do so because an order was obtained from a judge to examine her upon interrogatories. It became necessary then to disclose that this lady was not in a fit state of mind to give instructions or do anything whatsoever in the way of business; and therefore the present plaintiff here in the action was not in a state of mind to frame this action. On being, in consequence, more inquired into, it turns out that this gentleman has not the slightest right to any part of that £2,875, except the small fraction which I have referred to. Of course, as to the possible claim of about £50 for damages per acre, that may be another question which may have to be determined. As to that, the case stands thus: That there was a distinct order given some years ago by which the thing was ordered to be done, by the agent of the then lessor, contrary to the covenant of the lease, viz., that instead of doing that which was to be laid down in permanent pasture, the Home Field and the Gravel Pit Field, in respect of which there was a penalty if they were not laid down, they were ordered to be sown with barley or oats. Therefore, of course they could not be laid down in permanent pasture if he so ordered it. What was the effect of that order may be a question which will require considerable discussion at the hearing of the cause possibly. It seems to me there is a question to try which could not be tried at law, viz., the effect of that order. Mr. Kaye referred to a case in the 6th Vesey's Reports; and I may say I felt some little interest to know what case he was about to refer to. I remember being engaged in a very heavy case in which nothing was determined, and I was anxious to know whether more had been found than I remember being able to find. I do not think there is much to be found in the books about it. It was a case in which a gentleman claimed about £30,000 for penal rent, he having been on very good terms with the tenant for years, riding about with him over the fields, and talking of the things that were going on. Then, after he had a quarrel with him, he brought an action for £20,000 or £30,000. I remember very well having then, in very great haste, to file a bill to stop the action, and in which I had the great advantage of having the present Lord Kingsdown as my leader in the case. We then took occasion to look as much as we could into the books, but we found nothing more than that particular case which Mr. Kaye has now found. I was curious to know if other parties had been more successful about it. At the same time, I cannot say there is not a question to be tried in the matter, which question cannot be tried at law; therefore I think nothing more ought to be done on the present motion than restrain the action, or any other action being brought, the plaintiff undertaking to abide by such order (if any) as the Court may make, with reference to the defendant's proceedings in the action. That I shall, of course, have power to do. I simply say, "such order (if any) as the Court may make with respect to damages accrued in consequence of the alleged breaches of the covenant."

Mr. GIFFARD: Perhaps your honour will put it "damages" generally.

The VICE-CHANCELLOR: In consequence of damages.

Mr. KAYE: Such order as the Court may make if any.

The VICE-CHANCELLOR: Such order as the Court may make (if any) with reference to damages accrued due.

Mr. GIFFARD: I think your honour had better leave it general.

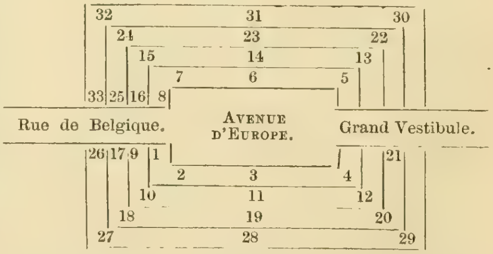
The VICE-CHANCELLOR: As to damages? Very well, if you like.

THE PARIS UNIVERSAL EXHIBITION OF 1867.

If the strictures passed by critics upon the appearance, external and internal, of the Great Exhibition held in this country in 1862 were severe—whether deservedly or not, it is not our province at present to say—we wait with some degree of curiosity for the strictures of these same critics, or of others of the same school, upon the building or structure of the Paris Exhibition, which will have been opened by the time this reaches the hands of our readers. The vocabulary of censure seemed, in the case of the 1862 building, to be so thoroughly exhausted that we fear there will be no words left strong enough to indicate their bad opinion of the Paris building; for that the opinion will be unfavourable as to both its external appearance and as to the want—the absolute want—of any vast and lengthened art-spaces in the interior, we have no manner of doubt; for in both respects, it is the antipodes of the 1862 building in construction and arrangement—very markedly so of that of the Crystal Palace of 1851. But while waiting to peruse the strictures which will be passed on these points, to which we do not care to contribute, we pass on to note very briefly the nature of the internal arrangements of this vast structure, so far as these are connected with the classification of the contents, and the ease with which they can be examined. We shall indeed be surprised if, while strictures will be freely passed as to the architectural effect, or rather the lack of it, arising from the peculiar form of the building, which prevents all "long-drawn aisle" and "the illimitable perspective" views, which were not the least characteristic features of the Great Exhibition of 1862, and very specially of that of 1851—we say we shall be surprised if, while strictures be passed on these parts, some opinions in the way of praise be not passed on the system of classification which has been adopted. When we consider the "intense ugliness" (the phrase is another's, not ours) of the building arises almost of necessity from this classification, it is difficult to see how the Commission is to be censured—pity as it may be that this ugliness is one of the results of an admirable system of internal arrangement. Of course, much yet remains to be decided as to whether the classification resulting from this system will be so clear in the actual building as it appears to be upon the printed plans of it. What are its features we hope in a few sentences to be able to make clear to our readers.

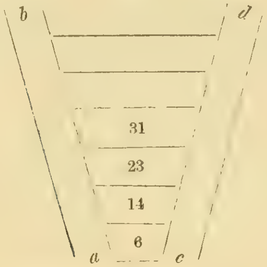
The building is made up of a series of concentric rings of varying width, these rings being elliptical in shape, or rather of the form of large quadrangles, with the corners considerably rounded and the sides curved. Where extreme accuracy of description is not desiderated the building may be said to be of the form of a large ellipse or oval. The various rings are roofed over, with the exception of the central or innermost space, which is laid out as a garden, furnished with pieces of ornamental water and decorated with fountains. This is indicated in Fig. 1. The reader will be good enough to note that in the diagram the rings are shown in the quadrangle with square corners: this is done to admit of types being used to form the diagram; further that part only, of the building is shown in the diagram—sufficient, however, to indicate the peculiarities of the classification. If the reader will suppose all the lines in the diagram to be considerably curved throughout the whole length, he will at once see that there is no probability of any of the fine vistas with remote perspective and effects of light and shade being found, for

Fig. 1.



the view is being perpetually stopped by one portion or the other of the curved sides. The only exception to this is the "grand vestibule," a not very wide passage or entrance which intersects all the concentric rings. This is indeed the only large apartment, or space, properly so called, in the building. True, from the much greater width and height which is given to the outermost zone or ring but one, and which is to be appropriated to machinery, there will be rather imposing portions of space at one time visible to the spectator.

Fig. 2.



The chief feature of the classification adopted is that each zone or ring will be occupied with specimens connected with one branch only of the arts, sciences, or manufactures. Thus let the ring or zone marked 1, 3, 6, and 8, be—as indeed in the actual building it is—the zone appropriated to the fine arts, the specimens of which are contributed by different countries, the visitor has only to start from the point 1, go on by 2, 3, 4, 5, 6, 7, and finish at 8, when he will have seen the world's contributions to the fine arts department of the Great Paris Exhibition of 1867. And if the zone 26 to 33 represents that filled by fabrics, he has only to start from the point 26, and finish at 33, when he will have seen in like manner the whole of the fabrics of the world. But this arrangement does not meet the requirements of divisions of countries or states. It is met in the following ingenious way: All the zones are intersected by radial passages, leading from the central garden to the outermost zone or ring, as *a*, *b*, *c*, *d*, in fig. 2, thus forming a series of segmental divisions; but to each country is given one or more of those segments, according to its importance and the number of the specimens which it sends. Then, when the visitor has a desire to see the united contributions of one distinct country, he has only to confine his observations to the segment or segments which are devoted to it. Thus, by taking any one of the zones or rings, one sees the contributions of the whole world to one department, while by taking a segment one sees a specific country; while at the same time he has the parts of the zones in this segment devoted each one to its own kind of specimen. Nothing apparently can be better than this arrangement, for it affords the most convenient and readily attainable mode of making comparative observations between country and country, as at the same time we can readily see what any one country has done in any one of its departments. It remains to be experienced whether the general public will understand, or if understanding, will care to avail themselves of this; though, to be sure, that is their look out. Compared with the classification, or rather the arrangement of the building, by which the classification could be carried out, in our two Great Exhibitions of 1851 and 1862, or with that of the French Exposition in 1855, there can be no doubt that the palm of merit is due to the classification here adopted.

The radial passages are very happily named after the various countries, as the Rue d'Angleterre, Rue d'Espagne; while the walks in the park, leading up to openings or doors of these, are called avenues, as Avenue de Etats Unis. The radial passages on the French side of the building are named after the various departments, as Rue de Normandie, &c.

In the *Mark Lane Express* of October 8, 1866, will be found a *résumé* of the proposed departments of the Exhibition connected with, or bearing upon the art of agriculture. Although from that list it will be seen that there are certain classes of subjects connected with agriculture exhibited within the building, the main strength and the principal attraction of the agricultural department will be centred in what may be called the agricultural annexes, and in the trial of implements and machines at the imperial farms of Vincennes and Fouilleuse. The principal annexes, as we have called them, are to be, not in the Champ de Mars, but in the Islands of Billancourt and a smaller island (Seguin) near it, on the Seine. The departments of machinery and of stock, and of the trials and competition which are to be carried out in connection with them, may be named briefly here. The implements and machines of the farm are classified under two divisions—first, those used in the exterior of the farm, in connection with the crops in the fields; and second, those used in the interior of the farm, or those used in connection with the preparation of the produce for the market, or as food for stock. Under the first division are comprised, ploughs of all kinds, cultivators, scarifiers, harrows, rollers, horse-hoes, sowing machines, mowing machines, horse-rakes, reaping machines, and vehicles. Under the second of the above-named divisions are comprised utensils of the dairy and the milk-house, brick and tile draining machines, steam engines, thrashing machines, winnowing machines, oil-cake breakers, straw, hay, and root cutters, cooking apparatus, hydraulic machines, weighing machines. The stock division is made up of cattle, sheep, horses, asses and mules, poultry, pigs, and dogs, and insects useful in the arts.

The competitions and trials are to extend over the whole period of the Exhibition, and are proposed to be carried out as follows:—In the month of April the ploughs of all kinds for animal draught will be tried with steam engines, hydraulic and weighing machines together with the oil-cake breakers, the straw and hay with the root cutters—these being held during the first fortnight. In the second fortnight the steam ploughs will be tried at the imperial farm of Vincennes, where to each competitor a surface of from eight to sixteen acres will be given; and all plots will be so arranged that the whole of the systems may be examined at once. In addition to the trials of the steam ploughs, harrows, rollers, horse-hoes, cultivators, scarifiers, clod-crushers, and machines for working drain tubes. In the first fortnight of May trials of manure-distributing machines, corn drills, churns and dairy utensils, and vehicles of all kinds.

In the second fortnight of May the trial of grass-mowing machines, hay tedders, and hay-rakes will take place at the imperial farm of Fouilleuse, where sixty acres of lucerne will be allotted to the various competitors.

In June will be tried the horse-hoes, and there will also be competitions in farriery operations; and the plans of the various rural establishments entered for competition will be examined. In the first fortnight of July the reaping machines will be tried on the imperial farm at Fouilleuse, on about seventy-five acres of wheat, and in the second fortnight trials of modes of shearing and clipping sheep. In the first-half of August the thrashing machines and winnowing machines will be tested. In September the various forms of cooking apparatus connected with rural life will be examined. In October the flax and hemp machinery will be tried. While in the same months the various modes of making beet-root sugar, and spirit, wine, beer and cider, and of starch, will be examined and reported upon.

As regards the competitions of animals. In the month of April, during the first fortnight the fat classes of cattle, sheep, and pigs will be gone through: in the second fortnight the various breeds of sheep other than the Merino breed. In the first half of May the breeds of milk cows will be exhibited; and in the second half the Merino breeds of sheep. In the first half of June the draught horses will be exhibited; in the second half poultry, and rabbits. In the first fortnight of July draught oxen, and in the second half racing and saddle horses will be shown. In the first fortnight of August come the dogs, and in the second half the draught oxen will be tried at work. The first half of September the pigs, and in the second half the asses and mules will take their turns.

From what we have above given, the reader will perceive that there is no lack of interest in the programme, which we trust will be faithfully carried out. One word as to the prizes. There will be a grand prize of 10,000 francs, or about £400, to be given to the exhibitor who by the methods of cultivation, improved mode of rearing, feeding, or breeding cattle, or by introduction of improved machinery, shall be judged to have done the greatest practical service to agriculture. For the implement and machine department there will be seven gold medals—each in value 1,000 francs—paid for improved modes of culture; and for other departments, such as buildings, there will be fifty silver and fifty bronze medals, and a certain amount of "honourable mention." In the stock department there will be competed for twenty gold medals, one hundred and fifty silver ones, and one hundred and fifty of bronze, together with some "honourable mention." In addition, however, to these medals, what may be called brevet honours are to be added according to award of the juries, in the shape of objects of art, as cups and vases; these extra honours being attached to forty of the medals, so that by the addition of a cup or vase any one medal in any one class will thus be increased in value. The work of art thus given as an extra honour is to be so designed that the medal will be able to be attached to it—the two thus forming one trophy.

The condition of matters within the building but a few hours before its opening may be best described by stating that it was the very converse of the state implied in the poet's line—

> "And universal order reigned."

The only exception to this was the British department. There, thanks to the labours of the workmen, aided by the administrative powers of the irrepressible Mr. Cole, so much had been done, that while others were toiling with what appeared to be difficulties of an insuperable task, they were looking on comparatively calm, and ready before the opening with what they had to show. We are all the more glad to be able to give this testimony to the business habits of those connected with the British department, not only as exhibitors, but as administrators, inasmuch as not a little has been said and published as to the British being the laggards in the race, and that while others would be ready for the opening they would not. Great, however, as was the confusion reigning in almost every other part of the building, the hearty labours of an army of workers—ten thousand we have heard named as the number of those engaged during the last few days of the week previous to the opening—had brought out of it by the morning of the first of April something like order. Not that by any means the departments were filled up or completed; but by dint of storing away—behind the scenes—half-emptied or full packing cases, and by spreading out such objects as were ready for display, a very fair and apparently complete show was made up for the inspection of the Emperor and Empress, who opened the Exhibition. This opening was done with no state or imposing ceremonial; indeed, it must have been felt by the officials that no State opening could have been carried out with any degree of striking effect in a building so utterly devoid of all grand and imposing spaces in this "Palace," as it is called, of the Exposition of the Universal Arts. Nothing more unlike a palace, indeed, the building as it is, could be. To apply the term "palatial" to it would be the exercise of an imaginative belief which it would be difficult to give credence to; for by no stretch of the imagination could we fancy it palatial. We wondered how the critics would approach the discussion of the building as a building: we do not, however, now that we have examined it, and seen the huge structure in all its aspects, anticipate that they will have much difficulty in the matter: a word or two will enable them to say what it is, however many it may take for them to say what it is not. Shall we reprint the word which one critic has already applied to it, and say that if the term *mean* is perhaps rather too strong a one, it is much more appropriate than the term *fine* would be. Certainly, this much may be said of it, that it is not in any way—architecturally or artistically speaking—to be compared with the building for the Exhibition of 1862. Much abused as that was, the term "palatial" was much more applicable to it than that we are now writing about. Vast the Paris building is; but though vastness is its main characteristic, even much of this, which in itself is calculated to render a structure imposing, is utterly lost by the peculiar shape or form, which enables only a part to be seen at once, so that its vastness is frittered away. Had, moreover, the designer been able to have so arranged the elevations of the different series as that the central one had been the highest, and the outer one the lowest, a degree of architectural effect would have been attained which is not so attained in the present building. At the same time, we say all this, not with a view of being hypercritical—as if not to be critical was to be nothing—but with rather a feeling of regret that the opportunity should have been lost of giving to the world a building as superior in architectural effect as it undoubtedly is in point of vastness of size and perfect (or nearly so) arrangement of its parts. Nor do we overlook the fact that this very completeness of arrangement has just been the difficulty with which the designer had to contend; for, to secure the classification of objects in the way decided brought about an arrangement which was most antagonistic to picturesqueness of detail. We have already indicated how this might have been secured; but we confess, at the same time, it is easier to find fault than to show how faults might have been avoided—easier to pull down than to build. After all, we must look to the contents rather than to the building which contains them—to the gems rather than to the casket. Only this much further will we say, that the attempts made to decrease the ugliness of the building by decking it out with flags and streamers only tend to render its paltriness as an architectural display all the more obvious. This remark does not, however, extend to the remarkably beautiful and even regal-looking canopy which covers the main avenue leading from the entrance on the Seine side up to the building. We cannot extend the same words of praise to the entrance itself: this is paltry and gingerbready, and put us in mind too much of the entrance to a dancing or tea garden. The canopy over the main avenue has, as stated above, a remarkably fine effect. It is composed of a rich dark-green cloth, studded all over its under surface with gold imperial bees. It is supported at the sides by tall masts, which are so placed with relation to one another, that they form a series of squares, and they have their surfaces painted in green and gold. Gilt ropes extend from the masts at the corner of each square diagonally, and these standing out in relief, serve the double purpose of ornamenting the surface of the cloth, and preventing its bagging. At the foot of each mast an arrangement of flags, with an escutcheon in gay colours lends the charm of variety to the whole. In arranging such an adjunct as this, the elegant taste of our French neighbours is decidedly shown; with appliances by no means costly in themselves, it is surprising what elegant and striking effects are obtained in the decoration of places where we, with precisely the same materials at command, would only succeed in making them tawdry and vulgar. Alas! for the finest works of man when opposed to the fury of the elements! When first we saw the elegant awning or canopy, which we have above described, there was a glorious sky overhead, which only a continental climate can give, and an effulgent sun lent a charm of light to the brilliant colours of which it was composed, which set the whole off in a regal way; but with the heavy rains and the blustering wind of yesterday (the 8th April), a different aspect was presented over the whole. Nor, indeed, did it long remain complete, to present any aspect at all but that of a hopeless wreck. For what with the rain, which collected in places above the awning, and the heavy wind, the various ropes gave way, and the beautiful cloth, with its glittering ornament, was either swaying wildly, and dangerously to passers by, to and fro, or was dragged along the ground. Altogether the aspect of this part of the Park was melancholy in the extreme.

We have already explained to our readers how the centre of the structure is occupied with a garden: the making of this a feature has been, we venture to say, a great mistake. Where the taste, which as a rule is a characteristic of the French, has in this instance been, it is difficult to say; it is, in fact, conspicuous by its absence; it is poor and paltry. Had this central space been roofed over, a remarkably handsome room would have been obtained, which would have afforded space, say for the exhibition of the works of the fine arts, and an architectural effect, which in no case in the structure, as it exists, would have been obtained. Great, however, as are the undoubted defects of the central garden—*as a garden*—these will be more than made up by the garden proper of the Horticultural Department. Although at present in any way but a finished state, it gives promise of being, as far as its extent enables it to go, very complete and suggestive in its departments. We regret, however, *en passant*, that the Commissioners have determined to make an extra charge to this. Yet while on the subject of charges, we may say we still much regret that there are other places in the Park which are to be charged extra for—at least one place, the Palace of the Pacha of Egypt. All this savours too much of the Cremorne-Garden style of doing things, to be, to our thinking, a wise procedure. People may not be aware, or, if made aware of, will not forget the fact, that once inside they are to be called upon to pay more in order to see all, and this will invariably lead to dissatisfaction. Far higher motives than that of merely making the most money out of it, should be the characteristic of the Commissioners of the Exposition. Then, again, there is to be an extra charge for admission to the Agricultural Department at the Island of Billancourt. In place then of the charge of a single franc (10d.) being all that one will have to pay for admission to see the *whole* of the departments of the Exhibition, the payments demanded will stand thus: To the Palace and Park, 1 franc; to the Horticultural Department, ½ franc; to the Egyptian Palace, ½ franc; to the Island of Billancourt (Agricultural Department), 1 franc—in all 3 francs, in place of 1 franc, which the majority of visitors will believe will be all they will have to pay. We venture to say that this will be found to be a great mistake. One franc should *frank*—we did not here intend a pun, although we have written one—the holder of a ticket to all the departments.

Since writing the above, we are able before despatching this paper to inform our readers as to the condition of the building and the arrangement of its contents after the work of the first week of the opening has been got through with. As anticipated by all those who have had any experience of former Exhibitions, a week has made a wonderful difference in the condition of the different departments. Still, many are in a very unfinished condition, and this applies also to the works in the Park. Here, there is very much to be done in some of the structures in it, a few of which are little more than begun in. Nevertheless, both in the building and in the Park, there is a vast collection of objects of the highest possible interest from an art-and-science point of view; and, if anything like a conscientious examination was made of them, it would take weeks to do it. Fortunately, our labours, so far as our readers are concerned, are connected with departments much more limited in extent of space and in the number of the objects which that space encloses. The implements and machines are chiefly shown in annexes or sheds in the Park, although there are a few exposed by French exhibitors in the Machinery Gallery. The British Annexe or shed is on that side of the park next the Seine, and runs along the extreme wall; that of the French is on the opposite side of the park near the Ecole Militaire. The British shed was designed to be quite open on the park side, an arrangement which is well calculated for the hot weather which will reign shortly; but in the cold and blustering weather which has been the rule here for more than a week, it was anything but comfortable; hence the closing in of the side next the park with sail-cloth. The annexe is long and narrow, yet affording sufficient width of space on either side for the articles exhibited, and a wide walk or alley in the centre. The stalls of our leading men are fitted up with great taste, and although the whole collection stands in marked contrast in point of completeness to the collection at our great shows, with which our readers are so familar, still what is deficient in number is made up with a thorough efficiency in workmanship and in design. It appears invidious now to name any one in particular when we do not at present propose to name all in general, but we cannot avoid saying that when we saw the superb example of what English mechanical work is, as illustrated in Fowler's steam-engine and clip-drum apparatus for steam-cultivation, we felt proud of what we could do, and that, in this department at least, all other competitors would be—to borrow a sporting phrase—nowhere. The labours of the Jury have commenced in the British department; but from the fact that our English representative has as yet been about, little satisfactory work has been got through with. The arrangements at the Island of Billancourt are very incomplete; indeed, a very general ignorance prevails of what is doing and what is likely soon to be done there. According to the programme, the trials of the steam-ploughs begin on the 20th: it is at present doubtful whether they will do so; certain at all events it is, that the trials will lose much of their interest if all our engineers who have made a name for their work in this department should follow the example of one firm by no means the least celebrated, who, we believe, have determined not to enter the competition. We may regret this; but when we consider what this competition involves, and what at the best can be got out of it, we do not wonder at it.

The commencement of the period in the history of the Exhibition at which a franc (10d.) is the price of admission, was inaugurated on Monday the 1st of April, by the influx of a large number of visitors, who were apparently not deterred by the miserable weather which greeted the day. Amongst the visitors was one distinguished one—the Emperor himself. We were much gratified by the quiet unobtrusive way in which he made his visit, and with the evidence of the deep interest which he had in the machinery department, where it was we saw him for some time. He was respectfully received, but in a way the very reverse of the noisy, hearty manner in which we receive our beloved Queen. By the way, this reminds us that in the machinery gallery there is an excellent full-length portrait of the Emperor, and next it, not one of the Empress, but of our Queen. We were glad to see this, as evidence of the good feeling, which if it does not exist universally amongst our neighbours, yet they evidently wish to cultivate.

Time, the great healer of old sores, is doing his work bravely in healing those consequent upon the unfinished condition of many of the departments of this Great Exhibition, to which we have alluded to above. Compartments but lately nearly if not quite unoccupied are being rapidly filled up; those which were partially are now fully completed; and large sections of the building present the aspect which will be their permanent or finished one during the whole period of the Exhibition. Chaos in many places is rapidly giving way to order, under the steady and willing labour of apparently well-organized bodies of workmen. And now that all this is happily the result of the work of the first two weeks of our history of the Paris Exhibition, we are able to give a more definite opinion as to the nature and value of its general contents. That, however, must be done briefly, as the special nature of our papers, and indeed as the special nature of the subject, demands; for such is in reality the vast aggregation and the value of the articles already to be met with in its various zones or circles, that it is not easy to find words, as it is not easy in our present paper to find space, to convey to our readers anything like a fair notion as to them. To quote for once the not very worthy to be quoted phrase of advertising circulars, the contents of this wonderful Exhibition "must be seen to be appreciated." We use the term "wonderful" with all due circumspection; for nothing less specific, if even it may be deemed exaggerated, can convey what we wish to convey to our readers as to the nature and value of what is to be seen in connection with it. For not only are the zones or circles the recipients of a vast variety of most interesting, suggestive, and in every sense valuable productions of arts, manufactures, and sciences, which, even although some of them are not yet in a complete condition, would occupy weeks to look at individually, and we venture to say months properly and fully to examine, but the surroundings of the building which are to be met with in the park are so numerous, and each of them so distinctive and suggestive in character, that they already constitute a department which is well worthy of a special visit to the gay city to see and examine. It is, indeed, a marvellous collection that is embraced within the limits of the Park. Almost every kind of structure which is calculated to convey in one building the distinctive characteristics of different peoples is to be met with there, from the chalet of Switzerland, the cottage of Russia, up to the gorgeous grandeur of the architectural displays of Spain, Portugal, France, Tunis, and Egypt. And not only are these various structures worthy of examination, as conveying most accurate ideas of the peculiar architecture of different nations, but their interiors are furnished with the same amount of care, so that you have only to enter them to see at once how and in what manner their inhabitants are housed, and by the fittings, which are also carefully finished, you can gather much of their habits of daily life. Some of them, indeed, are perfect studies, and with admirably conceived and executed life-sized figures with appropriate costumes, you can realise with wonderfully accurate fidelity much of their manner of life. Many of the large buildings are devoted to the purposes of art exhibiting, as for instance the halls which contain the paintings of Bavaria and of Belgium; while some of the lesser ones are occupied by various machines; while in some are to be met with examples of various branches of industry in full working order, with all the machines and appliances admirably illustrated. Nor must the reader conceive that all these buildings are erected in temporary gingerbread-fashion; not so: they are all carried out with a degree of solidity and painstaking care in the filling up and in the execution of those various ornamental or constructive details, both externally and internally, which could not be surpassed if they were designed to be the permanent occupants of their sites, in place of the temporary attractions of an Exhibition the period of existence of which is but limited. At the same time, we may here note what we have heard talked of as probable—namely, that the Park, with all its buildings and the horticultural department, is to be a permanent matter. If so, we may congratulate the Parisians on having added to the wonderful attractions which already exist in their charming city not the least wonderful of them. We have said that almost every variety of architecture is illustrated in the buildings of the Park, but there are numerous other structures of a less popularly attractive nature to be met with at various points of it: amongst these may be noticed the lighthouse—various mechanical or constructive appliances. And in the various structures erected at different points round and within the building, for the occupation of the boilers by which the steam is raised to drive the machines in the Great Gallery, the visitor interested in matters mechanical will find much that will interest and instruct. Each of these structures contains the boilers erected by the different nations for the use of their own machines in their special parts of the gallery; thus the British machines are driven by British, and the French by French boilers; so that even in this department a national characteristic is exemplified. So numerous are the buildings that, frequently as we have traversed the park which contains them, and thoroughly as at the last visit we have deemed that we have examined them, at our succeeding visit we find that there are still examples for us to notice, something new for us to admire. Then, again, the part of the Park allotted to the Horticultural Department is not the least interesting, as it certainly is not the least practically suggestive, department of the Exhibition. The gardens are admirably laid out, and through them a stream, purposely made, winds its way, opening out here and there into expanded spaces. Numerous buildings allotted to garden purposes and a rich display of garden appliances are to be met with. If, then, the reader will conceive—if, indeed, it is possible to conceive from what we have found it so difficult to find words to say—the vast building itself, filled, nearly so, with an immense collection of every product almost of the mind of man, the park with its numerous buildings and their contents, the number of machines and implements which lie scattered here and there over the park, and the attractions of the horticultural department, he will have some faint idea of what wonders lie here for his inspection, how great the attractions which will tend to draw him to visit this city—at all times, moreover, attractive in itself—and how well repaid he is likely to be for the outlay of such time, trouble, and, as an Irishman would say, "tenpenny bits," which the visit will entail.

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If the visitor to the Exposition enters from the side of the Park towards the Ecole Militaire, and turns to the left hand, he will come to a collection of agricultural implements and machines, by no means as yet—while we write—well arranged, huddled rather together in a state of great confusion, but amongst which he will find a good many things worthy of his attention; if not for any lessons of immediate practical value, still as suggestive of much that is different in practice from that of our makers; for they are all the "exhibits" of French manufacturers. Nor, in comparison with like machines or implements in our lists, will they take a higher place in this Exhibition. The distinguishing feature of the whole of the implements is a heaviness in design and in detail, and a want of the high finish which we give to our work—a finish which is not put on in order merely to give a good look to the work, but which conveys the idea to the mind that it is rather the result of a ready adaptation of means to an end—of an impossibility, so to say, to do bad work, however much the workman was disposed to do it. This is, of course, a somewhat exaggerated way of putting the matter, but which is, nevertheless, one which will readily enough convey to the minds of our readers what we seek to convey. If the visitor will, for instance, examine the collection of ploughs made and exhibited by French implement-makers, and will thereafter walk across the Park, and enter the annexe devoted to the British makers, and examine as carefully the collection of ploughs made by English makers, he will at once perceive the great difference which exists between them, viewed merely as specimens of workmanship. And this will be observable in other classes of implements—more markedly, perhaps, in those of machines where a still higher class of workmanship is demanded from the workman. Of course, in some of the classes of implements, the fact must not be overlooked that the peculiarities of many of them arise from the peculiarities of the locality and of the soil in which they are used, just as an American plough is made and specially adapted for a style of working which does not exist with us. Still, the remark we have made at the commencement of this paper is in the main true; and it may be accepted as a fact that the French implement-makers have a great deal to do before they reach the standard of the leading houses in the trade. We have referred above to the department of ploughs as evidence of this. Take a still higher rise in implement-making, and examine one or two of the French steam ploughs exhibited, and the remarks we have made will be still more appropriate. Apart altogether from the exercise of a critical knowledge of mechanical aarrangement and mechanical finish, we may venture to say that anyone examining a French steam-plough, and immediately thereafter an English one, will at once come to the conclusion that the English one seems much more likely to do its work than the French one. We say seems—for we are supposing the case of one who has not a critical mechanical knowledge; and that there is a good deal in this instinctive appreciation of mechanical fitness of things, no one who has at all considered the subject will be disposed to deny. At the same time, the fact already alluded to must not be overlooked, that circumstances do exercise a natural influence upon mechanical construction and arrangement—this, however, being more specially, if not altogether, true of implements where the nature of the soil (*i. e.*, upon which they operate) is varied and unlike in character, than in the case of machines in which the material upon which they operate is pretty similar in character wherever met with. An instance of this with reference to implements will be found in that part of the annexe, at the British side, devoted to American machinery, where some ploughs are exhibited. Judged by our standard, these will be considered as rather *outré*; yet they are designed, and designed well, to meet the requirements of American farming. These remarks are not uncalled for, nor will be practically useless, if we consider the task very special and peculiar in its characteristics which is before us. For we have to examine and describe the objects of a thoroughly cosmopolitan collection, the different classes of which require to be examined from their own stand point; and where comparisons are to be made between them, this has not to be lost sight of; on the contrary, must be kept steadily before us. Again, the objects in themselves are so numerous, and many of them do not possess that special interest which entitles them to special notice, that a careful selection must be rigidly attempted, and if possible attained, so that we may succeed in giving to our readers notices and details of those objects, and those only, which will present some features of either strictly practical or indirectly suggestive interest. Such, then, is the nature of our task; and if, in view of the difficulties almost inseparable from such a vast exhibition as this is, we succeed even to a limited extent only in carrying it out, we venture to think we shall well succeed. To do so it is surely unnecessary for us to say our best efforts will be given. With us fortunately it is a labour of love; not the less so that we have had the privilege during a long course of years of addressing the readers of this Journal on subjects kindred to those which for the next few weeks will engage our attention.

FOREIGN AGRICULTURAL GOSSIP.

Agriculture plays in one way or other no inconsiderable part at the Paris Universal Exhibition and its off-shoot at the Ile de Billancourt. French agricultural implement makers appear to have made considerable progress, especially in agricultural engines and thrashing-machines. Iron is being used more and more in French ploughing apparatus, and the articles manufactured present more solidity. In order to be convinced of all this progress, it is sufficient to examine the collections of implements exhibited by MM. Albaret, Gérard, Pinet, Cumming, Meixmoron-Dombasle, Bella, Ganneron, Peltier, &c.—There are few beasts on the Champ de Mars, space being too precious. There are collective exhibitions, such as one organized by the Seine-et-Marne for example. M. Giot has installed a model farm; M. de Kergolay has organized a dairy; M. Bignon, seeking before everything for rural simplicity, exhibits a building as it exists on his property at Theneuille (Allier), where he carries on the *métayage* system with much success. This building will be constantly occupied by cattle and sheep, which will be renewed every fortnight for the Billancourt exhibition. While the Universal Exhibition, notwithstanding certain imperfections, invites all people to peace, another current of ideas troubles the tranquillity of the country districts as well as the towns of France. The French army, it is said, is insufficient, and it is contended that it is necessary to re-constitute it on the basis of a new system of recruiting, which, at a given moment, would put the Government in a position to increase the military force of the empire without imposing on the budget exorbitant charges out of all proportion to the requirements of the other public services. The rural population—which appears to fancy that it always has to pay the heaviest proportion both of blood and treasure—has been much moved by this scheme. Already, on the occasion of the great *enquête*, agriculturists had energetically blamed great military contingents and distant expeditions, two things which they regarded as aggravating the want of rural workmen. Now, they are petitioning and writing to deputies, and they say clearly enough, "If France is threatened, we will all take arms; but if she is not threatened, leave us to our works of peace." Brochures have appeared in abundance upon the momentous question, and one especially has produced a very great sensation. It emanates from a man who bears one of the greatest names both in the military and in the agricultural world, and it makes revelations which, without attacking in the least the reputation of French troops for bravery, lead to the conclusion that French military organisation is defective in many respects. On the one hand, there are old matters of routine which are preserved without reason, and, on the other hand, innovations are put in practice without having been sufficiently matured. All these traditions and all these experiments cost France dear; and, after all, there are some who say that it is not by often changing uniforms any more than by maintaining certain regulations, which date from the time of the great Frederick, that the condition of an army is seriously improved. Something else requires to be done, and the question is whether that something else is the converting the whole French people into a people of soldiers. It is astonishing that our epoch, after having done so much to consecrate civil liberty, should return to a social state in which nations, always ready to destroy each other, proclaim peace in theory, and condemn themselves in practice to live on a war footing. It is not thus that large budgets will be reduced, and that great public works will be accomplished. The present Napoleon declared at Bordeaux, now nearly 15 years since, that the Empire which he had established was peace—some of his grumbling agricultural subjects begin to mutter that his Majesty meant an armed peace.—A number of experimental stations have been founded in Germany, where agricultural processes and methods are carefully experimented upon and studied. These establishments are divided as follows between the different states of Germany: Kingdom of Prussia—Province of Brandeburg, Daume station, near Lüterbogk, founded in 1857 by a private society under the direction of Dr. Hellriegel. Province of Pomerania, Regenwalde station, founded in 1863 by the Agricultural Society of Pomerania; receives from the state a subvention of £180 per annum, and is directed by Dr. Birner. Province of Saxony, Halle station, founded at Grossmechlen in 1854 by the Agricultural Society of the province of Saxony, and removed to Halle in 1865; receives from the state a subvention of £180, and is directed by Dr. Nathusius-Hundiburg. Salzmünde station, founded in 1865, and maintained by a society of sugar manufacturers in Saxony; director, Dr. H. Grouven; subvention, £375. Province of Silesia, Marienhütte (near Saarau) station, founded in 1857 with the assistance of the Silesian Society of Agriculture and Herr Kulmez; subvention, £165; director, Dr. P. Bretschnieder. Province of Prussia, Insterburg station, founded in 1858, and directed by Dr Pineus; subvention, £120. Province of Posen, Kuschen station, near Schmiegel, founded in 1862 by the Agricultural Society formed among the clubs of Kosten, Fraustadt, and Pratdschin; subvention, £157; director, Dr. E. Peters. Province of the Rhine, Bonn station, near Lauersfort, founded in October, 1864; subvention, £76 10s.; director, Dr. Karmroth. Old kingdom of Hanover—Weende station, near Gottingue, founded in 1867 with the assistance of the Royal Agricultural Society of Celle: director, Professor Henneberg. Old Electorate of Hesse—Heidau station, founded in 1857 by the Central Agricultural Society of Electoral Hesse; director, Dr. Dietirch. Kingdom of Saxony—Mockern station, near Leipzig, founded in 1851, with the assistance of Dr. Crusius, of the Ministry of the Interior, and the Society of Agriculture of the circle of Leipzig; director, Professor Knop. Chemnitz station, founded in 1853, with the assistance of the Government and the local society of agriculture; director, Dr. Reuning. Pommritz station, near Bautzen, founded in 1867, with the assistance of the Minister of the Interior and of the local agricultural society; director, Professor Lehmann. Duchy of Brunswick—Brunswick station, founded in 1862, by the Agricultural and Forest Society of the Duchy of Brunswick; director, Dr. Gustave Kuhn. Duchies of Saxony—Jena station, founded in 1862, with the authority of the Grand-Ducal Government, and with a subvention of £150; director, Dr. E. Stockhardt. Duchy of Anhalt—Cothen station, founded in 1865, by the local society of agriculture, with a subvention of £45; director, J. Heidepriau. Kingdom of Bavaria—Munich station, founded in 1865, by the society for the establishment of experimental agricultural stations in Bavaria; director, Dr. J. Fohlard. Memmeingen station, founded in 1865, with the assistance of five local agricultural societies; director, Professor Fleischmann. Bayreuth station, founded in 1866, by the committee of a local agricultural society. Kingdom of Wurtemberg—Hohenheim station, founded in 1865, by the Bavarian Government; annual subvention, £290. Grand Duchy of Baden—Carlsruhe station, founded in 1859, by the Grand-Ducal Society of Agriculture, with a subvention of £70; director, Dr. J. Nessler. Empire of Austria—Prague station, founded in 1853, by the Agricultural Society of Bohemia; Liebwerb station, founded in 1864, by the Agricultural Society of Bohemia; and Labositz station, founded in 1865, by Prince Schwartzemberg; director, Dr. Joseph Hanamann. This recapitulation may appear a little "dry," but we may possibly return, nevertheless, in more detail to the organization of these useful establishments, and to the services which they render to rural industry. We may add now that Switzerland has joined in the movement, four experimental stations having been established in the cantons of Berne, Schwitz, Fribourg, and the Grisons.

LORD ELCHO'S GAME-LAWS AMENDMENT BILL.

The following is a copy of this Bill to "Amend the Laws relating to Game in Scotland:"—

Whereas it is expedient to amend the law relative to the preservation of game in Scotland, and to assimilate the law of Scotland with the law of England, relative to tenants taking game:—

Be it enacted, &c.—

I. This Act may be cited as the Game-laws Amendment (Scotland) Act, 1867, and shall apply to Scotland only.

II. In this Act, unless there be something on the subject or context repugnant to such construction, the word "tenant" shall mean any person now or hereafter in occupation of lands in Scotland under any lease, or agreement of lease, written or verbal. The word "lessor" shall mean any person entitled to the rent of such lands. The word "county" shall include stewartry, and also any ward or other like division of county or stewartry. The word "sheriff" shall include sheriff-substitute.

III. From and after the passing of this Act, it shall be lawful for any tenant in occupation of lands in Scotland, under any lease or agreement of lease, where the game is not reserved to the proprietor by the lease, or otherwise, to kill and destroy hares upon the land in his occupation in like manner as it is now competent for tenants in occupation of lands in Scotland to kill rabbits thereon.

IV. No tenant in occupation of lands in Scotland, and whose occupation shall commence after the passing of this Act, shall be debarred from killing hares and rabbits on lands in his occupation otherwise than by an express stipulation inserted in the lease, or agreement of lease, under which he occupies the said lands, or otherwise, by written agreement duly executed.

V. It shall not be necessary for a tenant in occupation of lands as aforesaid, who shall kill hares or rabbits on any lands occupied by him, being otherwise entitled to do so, to pay in respect thereof any assessed taxes, or to take out any licence to kill game, in terms of the Act of the twenty-third and twenty-fourth years of the reign of her present Majesty, chapter ninety.

VI. No person, authorized in writing by a tenant in the occupation of lands to kill hares or rabbits thereon, shall be required to take out any licence, or be liable to any duty of assessed taxes as a gamekeeper, nor be deemed or taken to be a trespasser in terms of the Act of the second and third years of his late Majesty King William, chapter sixty-eight.

VII. And whereas it is desirable that the word "game" should be held to include deer; and whereas also doubts exist whether deer are to be considered as game in the construction of certain provisions in the Acts of Parliament hereinafter specified: It is enacted, that from and after the passing of this Act the word "game" shall be held to apply and include deer; and the word "game," as used in the Acts ninth George the Fourth, chapter sixty-nine, seventh and eighth Victoria, chapter twenty-nine, and twenty-fifth and twenty-sixth Victoria, chapter one hundred and fourteen, shall be construed as including deer, and that notwithstanding any declaration in the said Acts to the contrary; and all the provisions of the said Acts applicable to game shall apply to the taking, killing, and destroying of deer, saving and excepting always the killing of deer by hunting with hounds, to which the provisions of the said Acts and of this Act shall not apply.

VIII. And whereas by divers laws now in force in Scotland the lessee or tenant of any lands or heritages has no right or privilege of taking or killing any game whatever on the land occupied by him without the permission of the proprietor of the lands; and whereas it is expedient to assimilate the law of Scotland with the law of England in this respect: therefore, from and after the passing of this Act it shall be lawful for any person who shall occupy land in Scotland as lessee or tenant of the same, and who shall have obtained such game certificate or licence as may by law be required for the time, to kill and take game on the land so occupied by him: provided that the lease or agreement of lease in virtue of which he occupies the said land shall contain no reservation by the lessor of the land of the right to take and kill game.

IX. From and after the passing of this Act it shall be lawful for any person who shall occupy land in Scotland under a verbal lease or agreement, and who shall have obtained such game certificate or licence as may by law be required for the time, to take game on the land so occupied by him; provided the lessor of the land shall not have expressly reserved his right to the game on the said lands.

X. Provided always, that nothing herein contained shall be held to confer on any tenant an exclusive right to kill game on the land occupied by him, the right of the lessor to give permission to any person to kill game on his lands being reserved entire.

XI. From and after the passing of this Act a tenant shall be entitled to recover compensation from his lessor for any damages he may sustain in consequence of or by reason of the increase of hares, rabbits, or game unduly encouraged or not duly prevented by lessor on lands occupied by the tenant during the currency of his lease, provided that such increase shall arise subsequent to the passing hereof; and such compensation shall be sued for and recoverable only in the sheriff court of the county wherein the lands in respect of which the said damage is alleged to have been sustained are situate; and the judgment of the sheriff substitute or sheriff, in so far as the same consists of findings in point of fact, or fixes the amount of damages, shall be final and not subject to review, it being competent to appeal from the decision of the sheriff-substitute to the sheriff; but provided always that the judgment of the sheriff-substitute or sheriff, in so far as the same consists of findings in law, shall be subject to the review of the Supreme Courts.

XII. Nothing in this Act contained shall affect the rights of parties under written contracts executed before the passing of this Act, or affect any leases of game existing at the date of the passing hereof.

LIABILITY OF CATTLE SALESMEN.

ROBERTSON *v.* SWAN.

In this case, which came before Lord Barcaple and a jury at Edinburgh, on the 11th April, Thomas Robertson, butcher in Ardrossan, was pursuer, and John Swan and Sons, cattle salesmen in Edinburgh, were defenders. The action was to recover a sum of money paid by Robertson to Swan for certain cattle under peculiar circumstances. Mr. Robertson purchased a number of cattle from the Messrs. Swan at Glasgow in August, 1865, some of which he took away immediately to Ardrossan, while the rest were left with the defenders for a week—it having been agreed, as set forth by the pursuer, that the defenders were to keep the cattle for that time at their own expense and at their own risk. In the course of the week, it appears, cattle plague had broken out among these cattle, one of which died before the week had expired. The pursuer founded his claim on the ground, as alleged, that the defenders concealed this circumstance from him until after the cattle were paid for. The defenders denied liability, on the ground that the Glasgow Cattle Market was a ready-money market; and further maintained that they undertook no risk, but merely retained the cattle until the price should be paid.

The issue sent to the jury was as follows: "Whether, on or about 17th August, 1865, the defenders sold to the pursuer eight bullocks, upon an agreement that they were to be delivered and paid for on 28th August, 1865, and to be kept by the defenders in the meantime at their own risk; whether, while the said bullocks were being so kept by the defenders, they became infected with the cattle plague, or other serious disease, whereof one of them died, while still in the defenders' custody, and at their risk; whether on said 28th August the defenders, in the knowledge of the said facts, concealed the same from the pursuer, and applied for and received from him payment of the sum of £100 as the price, or part of the price, of the said eight bullocks; and whether the defenders are indebted and resting-owing to the pursuer the said sum of £100, or any part thereof, with interest from 28th August, 1865."

Lord Barcaple, in charging the jury, said: The issue which you have to try puts four distinct questions, and you have been told quite truly that you cannot find for the pursuer unless you should be satisfied that he has proved facts sufficient to answer every one of these questions in the affirmative. The first question is, Whether the eight bullocks were sold under certain agreed and specified conditions? secondly, Whether after being sold they became affected with cattle plague, and one of them died? thirdly, Whether the defenders, or one or other of them, in the knowledge of these facts, received the £100 from the pursuer? and lastly, Whether the defenders are resting-owing to the pursuer the said sum of £100? And you cannot find in the pursuer's favour until you have answered all the first three questions in the affirmative. The pursuer's claim in this case is rested on a special and distinct agreement, which he alleges has been made with him, and without which agreement the risk plainly had lain on him as the purchaser. The first and most important question, therefore, which you have to consider, is whether the pursuer has succeeded in proving that special agreement. It lies with him to prove it, for the law does not presume it in his favour, but presumes the contrary. This is unfortunately a case in which there is an extreme conflict and contradiction of evidence in regard to the most important points in the case. To some extent that conflict of evidence might reasonably be accounted for by the distance of time, and by various circumstances operating to detract and mislead the attention of witnesses. That may, to some extent, but it will not altogether, explain the contradictions in the evidence, and least of all will it do so on this first fundamental point, namely, whether the alleged agreement as to risk was entered into. I am afraid that it is a question which will rest entirely on the amount of credit which is due to the witnesses on the one side or the other. The statements on either side are quite distinct and specific, and therefore, if you believe the pursuer's witnesses, the agreement is quite clearly proved; if you believe the defender's witnesses, it is absolutely disproved. That is an unfortunate and painful condition in any case, but it is just the circumstance which makes it peculiarly a case for the consideration of a jury of practical men accustomed to treat with one another in the ordinary transactions of business, and to apply to these transactions the good sense which prevails in the world at large in regard to business matters. But, gentlemen, in a case of such conflict, it is always one of the questions which arises at the outset in regard to the probability of the case stated by either party. It is not conclusive, but common sense tells us that it is very important. It is pressed on your attention by the defenders that there is a great amount of improbability in the supposition that they could have entered into such an agreement. They are gentlemen carrying on an extensive business as cattle agents, not selling cattle for themselves—I presume never selling cattle on their own account—and I presume their customers would not have the same confidence in them which they have if they did. You are told by them, and there can be no doubt, that in this particular case the cattle sold were not their cattle, but the cattle of a foreign consigner. Now, it undoubtedly makes it unlikely that they should have come under any obligation for the keeping of cattle and furnishing them with grass for a considerable number of days, or for any number of days, and that they should have undertaken the risk. It is not quite so clear that they might not undertake certain things, not on their own account, but on account of their constituent. We were told by Thomas Swan, whose evidence was certainly distinct—the evidence of a very intelligent man—that in some cases they did keep the cattle for a time, sometimes keeping them in their own fields, and charging the parties, but sometimes making it a part of the bargain of sale to charge the keep to the seller. We have not the evidence here about the transaction which they had in this case with their constituent; I do not even understand that any copy of the account is in process; but the evidence of Mr. Swan, senior, was to the effect that it was usual to remit the price, under deduction of commission and costs, by first post, and it has not been shown that they dealt with the seller in this case on any unusual footing. The pursuer could, by recovery of the document, have shown whether in this case they kept the transaction open, so as to leave room for charging against their constituent the results of any unfortunate risk. He has not done so, and on the question of probability you must judge for yourselves. There is another circumstance I may speak of, which is founded on the other side as affecting the credit of the case for the defence, and as casting a sort of imputation on their case—I mean the circumstance that Thomas Swan, after he was aware of the death of one of the cattle, sent a telegram to the pursuer about lifting the cattle, just as if the whole cattle had been alive, and that on meeting him at the railway station he received payment of £100 from him without communicating that fact. Now, gentlemen, I cannot look on that as a fortunate or altogether pleasant circumstance in this case. I think you will agree with me that in all business matters it is expressly desirable to have entire openness and no concealment; and, therefore, one cannot look at the first aspect of this particular incident without feeling that it suggests an unfavourable view to a certain extent for the defence. But then, again, it is just one of the probabilities. It is not of the essence of the case, and it is only fair to Thomas Swan to keep in view the position in which he was placed. If the defenders were really entitled to receive this £100, whether one of the animals had died or whether all the animals had died, his position was a difficult one. He had not long before had an unfortunate transaction with this same pursuer; the pursuer had not long before been bankrupt, and had paid only a small dividend, and it might very reasonably occur to Thomas Swan that the pursuer was not very likely to pay, at all events without legal steps being taken, and the result of taking legal steps might have been to land them in the position they formerly were in. I don't think that should have led him to take the course he did; but in candour I am bound to say I feel the difficult position in which he was placed, and it appears to me that that must be taken into view. Another incidental matter which raises some difficulty is the kind of dispute which may be said to exist between Thomas Swan and M'Call in regard to whether the latter intimated on the Monday forenoon that the animal had died of *rinderpest*. That is a question which has no direct bearing on the first or main question, but it goes to affect the reliance you could place on Thomas Swan's evidence, if you are satisfied that he is completely and satisfactorily contradicted on another point by Mr. M'Call. M'Call is quite clear in his recollection that he had made up his mind it was cattle plague before he saw Thomas Swan on the 28th. Thomas Swan is equally clear as to the reverse. The book throws some light on the subject, though rather an uncertain one; for even if it be true that the entry was dried in the second portion with blotting paper, and left to dry on the first, that may be accounted for by the fact that after writing the first words, the writer may have paused for a few moments to think or to consult others how to express himself. I do not think you could make a great deal of the engraver's evidence either way; and it is for you to say whether you are satisfied that the knowledge of the animals having the cattle plague is brought home to Thomas Swan on the forenoon. The material question, however, was whether the fact of the agreement to take the risk is proved. The evidence by which the pursuer seeks to establish that agreement is perfectly competent, if you are satisfied of its credibility, and it is for you to consider the credibility of the evidence on the one side or the other, tested by the probabilities of the case, and to make up your minds upon it. The only observation that occurs to me to make is this, that undoubtedly not only in this case does the burden of proving his case devolve on the pursuer, but it is a bargain which, in the circumstances, and looking to the position of parties, was not likely to have been entered into. These gentlemen are simply cattle salesmen, whose business it is to sell the cattle of other people. In this case the seller of the cattle was an owner abroad, and it is extremely improbable that instead of the money being at once got for the cattle, a transaction should be entered into the result of which would not appear for a number of days, a transaction which could not be contempleted by the owner of the cattle at a distance, and which would, to say the least, be a most unusual and one would say a most improvident thing for cattle salesmen to do. But it is for you, gentlemen, to consider all these points on the evidence. If you are of opinion that the alleged bargain has not been proved, you must find for the defenders, because it is unnecessary in that case to go further. If, however, you come to a conclusion favourable to the pursuer on that point, you will then consider whether there is sufficient evidence that these animals were afflicted with the *rinderpest*, and that the defenders were in the knowledge of this fact, but concealed it from the pursuer. Your duty will then be plain enough to find the pursuer entitled to repetition of this sum of £100. It is only, however, by coming to a conclusion favourable to the pursuer on all these three points that you can find in his favour on this last clause of the issue.

The jury then retired, and, after an absence of about half-an-hour, returned with a unanimous verdict for the pursuer.

DEATH OF MR. J. B. THOMPSON, OF ANLABY.—The death of this distinguished agriculturist occurred in the hunting-field, on Thursday, April 18, during a run with Sir Clifford Constable's stag-hounds in the neighbourhood of Sutton. Mr. Thompson had long been subject to the disease of the heart, and his death was most probably occasioned by sudden excitement, as he fell lifeless from his horse when merely going at a hand-gallop. Mr. Thompson was well known on the show-ground as a judge of shorthorns, in which capacity he acted at the last meeting of the Royal Agricultural Society at Plymouth, in 1865, and at the last meeting of the Smithfield Club, in December, 1866. He was also one of the stewards of long-wool sheep at the last Yorkshire Show. Mr. Thompson was between fifty and sixty years of age.

HORSES OVER-REACHING—A REMEDY.—A correspondent says: "Make the shoe its natural length, or a trifle longer, with the toe-calk of the forward shoe high, and the heel-calk low. The hoof will then stand further forward, and more removed from the stride of the hind-foot, which, being shod with a low toe-calk and high heel-calk, will strike the ground before it reaches the fore-foot. An interfering horse usually strikes with the inside of the hoof, about two inches from the toe; therefore, make the shoe straighter on the inside and rasp the hoof accordingly."—*Rural New Yorker.*

CALENDAR OF AGRICULTURE.

Finish the planting of potatoes from last month, and plant beet on drills of well prepared, strong, loamy land of twenty-eight to thirty inches wide, and rolled with a light weight. If lime be applied use it as directed last month. Sow Swedish turnips—the green and yellows—in the last half of the month, on drills of well-prepared strong loams, twenty-eight inches wide; and, in dry weather, roll with a light weight: in showery weather the roller is not required.

Plant, in the same way, cabbages, savoys, and kohl-rabi from the seed-beds, on drills thirty inches apart, and one foot betwixt the plants in the drills. These broad-leaved plants, requiring a large allowance of half-rotted farmyard dung, must be planted on strong clayey loams, and during wet weather, as they want much moisture. Fill up all blanks with fresh plants, in order to obtain an even and level crop. Sow early turnips for an autumn crop, as tankards and whites; and sow rape to be consumed on the ground as preparatory for wheat.

Pare and burn rough grounds, and spread the ashes to be cooled. Prepare the lands for turnips and wheat by ploughing, harrowing, and rolling, and hand-picking weeds and stones.

Horse and hand-hoe the early-drilled crops.

The heaps of dung carried to the fields in winter from the cattle yards must be turned over with hand-forks, and the lumps carefully shaken out and placed in a loose condition. Fermentation will speedily commence; and during its progress, the dung is spread along the intervals of the drills and immediately covered, and the seeds sown. The warmth of the dung is of much benefit to the plants, especially to the tender germination of the turnip.

Stall-fed cattle will now be all cleared off—the fat ones to the butcher, and the more backward sent to the pastures to be fattened on grass. Cattle of all ages will now go to grass—the milch cows to a home field of permanent pasture, well watered and sheltered, and the store cattle to the pasture fields, and arranged by age and size, which conduce much to the thriving of the animals. The oldest calves may go to a grass paddock, and have a supply of clovers and vetches in a rack. A shelter shed and water are indispensable to all pasture fields.

The latest lambs will require an attention, to be placed on the best pastures, to be raised to an equality with the forward ones, than which in an even condition nothing more clearly shows skill and judgment in the economy of animals.

The ewes and lambs that are eating the early vetches and rye must have fresh food every two days by removing the moveable fences. The sheep may be folded on the bare grounds, and moved every two nights. The herbage may be cut, and placed in racks, and very economically. Begin the soiling of cattle and horses in the yards, and of the milch cows also, if the pasture be not abundant. Feed the store pigs with clovers and vetches, and give ample littering for all animals. As the early green crops are consumed, plough the land for turnips.

Dig hop grounds, and tie the bine to the poles. Shut up watered meadows for hay. Weed young hedges, but not exposing the bare roots to drought—rather leave a part of weeds to hold moisture and coolness. Cut oak trees: strip and dry the bark.

Wash sheep by hand in a running stream a week or two before shearing commences, to prevent the maggot-fly depositing the eggs. Sprinkle the animals from head to tail from a dredging box with a mixture of hellebore powder and black brimstone, $\frac{1}{4}$ lb. to $\frac{1}{2}$ lb.

Mares may be put to the stallion, and colts gelded, in early situations, in the end of the month, but better in next month.

It must never be omitted that gates and fences be thoroughly repaired and placed in the best condition for use by the beginning of this month, at the time when cattle are put to grass. Slovenly management is never in any way better exhibited than by gaps in hedges (encouraging trespass), and gates trailing on the ground, and often joined in broken pieces. Gaps and weak places in hedges are best defended by a row of sawn or cloven stakes driven into the ground, and the tops secured by a rail with a nail into each stake. The side branches of the hedge may be twisted among the stakes, and in some cases grow to fill the gap; but the want is best supplied, in the first years of the hedge's growth, by planting new sets among fresh earth, or by gathering in the side branches across the weak places. The cut branches of hedges being placed or woven into gaps to stop the trespass, soon become decaying timber or dead wood, and are very hurtful to the live wood of the hedge. Sawn stakes are much to be preferred.

The weak places of hedges at the sides of gateways are best secured by a nail and two posts inside the field, and high, to prevent the trespass. The first setting of the hedge must place a triple row of quick-sets close to the gate-post, in the length of three yards, among widely-built stones of two or three tiers of walling. In this position thorns always grow well.

The strength of a gate depends on the solidity of the hanging post, from being deeply placed in the ground and rammed very freely with moist clay. The best catch or fastening is by a chain and hook, though it allows the gate to play. The spring catch is liable to be rubbed out by the animals; and the fly-gate is ever too high or too deep in the catch. The chain, though troublesome to riders, is the most secure fastening.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Kidney beans, scarlet and painted-lady runners are first called for. Sow the dwarf variety for a full crop in July, and repeat in the third week. The soil must be warm: the seed perishes in wet grounds; and yet dry, arid soils are not suited for the plants. The runners do best in a shallow trench over a layer of moist, decayed, mixed dung a few inches under the earth. Return the soil over the manure, press it moderately firm, and sow about three inches below the upper surface level, covering to that depth with light earth. The season and the weather are the directors. The earliest sowings of beans are best done by sowing the seed in pots in April, and having healthy plants ready to be transplanted into the trenches, formed as described, which receive the summer sowings in the open ground. In dry and scorching weather the superiority is most evident of the trenches affording shelter to the plants, which do not flag, as on level grounds. In dry weather a sprinkling with guano-water is very useful to plants with broad leaves.

Peas: Henceforward sow Knight's marrow, and the fine Dorset variety—there called Adamson's Matchless; and to guard against mildew, trench the ground of a row three feet wide and one deep, mixing very rotten dung with the bottom spit. Water profusely by the rose; fill up with the soil, and raise it to a flat ridge a few inches high along the centre. Water again to ensure a thorough wetting of the ground. In a day or two after, sow the peas an inch asunder in regular order. Late crops of peas are well secured in this way into the month of October by continued sowings from this time.

Potatoes: The late crops should be set, if not yet planted. Let the rows, where practicable, range north and south, to admit an equable diffusion of sunlight.

Sow cucumbers on a ridge over manures. Repeat all the sowings of last month, excepting the tap-rooted plants, to keep up successional supplies. Sow dwarf Indian corn about the 15th. Suffer no weeds to prevail, and where there is time to Dutch-hoe and finely rake every portion of uncropped land, the extreme neatness of the garden will amply repay the trouble.

Farmyard dung and any well-rotted collection of animal and vegetable matters must be very liberally applied to the crops of the kitchen garden, as potatoes and beet, and all tap roots. The production of humus is a grand object from the decay of animal and vegetable matters, as it is both the source and produce of life: the presence of it is most essential. The rotation of crops must be used, as in farming: root-plants and fibrous crops must be grown in alternation, as peas after beet and potatoes; the fibrous roots that creep horizontally succeeding the tap tubers and bulbs that divide and heave the ground. This rule admits no variation.

FRUIT GARDEN.

Disbud fruit-trees, by pinching out with the thumb-nail all foreright and back shoots and laterals that may not be wanted, always leaving a well-placed shoot at, or near, the origin of a fruit bearer of this year. Water strawberries, if the ground and weather be dry. All plants under glass must have fresh air in hot weather mornings.

FLOWER GARDEN.

The shrubberies are often rendered littery by the falling of laurel and other evergreen leaves: let such be removed to the compost grounds. Eradicate lilac suckers, and keep all shrubs in figure by judicious thinning back to larger branches: attend to every office of neatness and order as respects weeds, rolling of gravel, and the lawns prior to mowing.

This is the season for bedding-out flowers on the parterre system, in plots on lawns, by grouping in masses, with room for future growth. The elegant plants are well displayed in this way; but the most tender are easily killed, even by two or three hours' frost; therefore the final regulation may not be attempted before the 18th.

Sow annual seeds in the borders; biennials in a nursery plot for the next season, to form stocks. Propagate, by slips and cuttings, wallflowers, rockets, &c.; put a glass over to shade them.

Roses must be watched: the worm to the bud is a sore enemy. Stir the surface of grounds, when nearly dry, after heavy rains, and learn to use the hoe and rake adroitly. Air and water: Attend to these in any glass structure.

THE MANURE PIT.—The Agricultural Editor of the *New York Times* gives a description of a barn, recently erected by Dr. Hexamer in Westchester county. In referring to the stables he says: "The floors of the stables are watertight, and the surface descends a trifle, so that all the liquid flows in gutters into the manure pit directly in the rear of the stalls. Small flap floors are prepared close to the floor, which provide a convenient opening for throwing out all the solid litter into the manure pit, which is about 100 feet long, 6 feet wide, 4 feet deep, substantially cemented on the inside and bottom, so that no surplus water can enter or escape. At one end of the pit stands the privy, which furnishes much excellent fertilizing material. The manure is spread around evenly, and covered with muck or rich mellow soil. The pit will contain about 100 loads; and on that small farm it is filled and emptied three or four times annually with the choicest compost. With such a pit no manure is wasted. As the liquid from the stables is not always sufficient to keep the manure, containing a large proportion of nitrogenous matter, from becoming "fire-fanged," the leader from the eave-troughs is so arranged that any desirable amount of water can be turned into the manure pit during the fall of rain. The pit is so arranged that a cart or waggon may be driven along close by its side, from end to end, thus facilitating the great labour of forking and shovelling the compost. The arrangements for making barnyard compost, on which farmers must rely chiefly for material to maintain the fertility of their grounds, are most complete, convenient, and economical. Those farmers who waste half of their barnyard manure should learn by these suggestions to save all their manure, and thus raise bountiful crops of grain, roots, fruit or grass."

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR APRIL.

Although considerable quantities of rain have fallen in most parts of the United Kingdom, the accounts from the leading districts in reference to the young wheats are very favourable. Out-door farm labours have been much interrupted owing to the excessive moisture; but, on the whole, they are in a forward state. Barley as well as most other kinds of spring corn are looking well. So far, therefore, as the appearance of the crops is concerned, there is every reason to be satisfied; still wheat has further advanced in price, notwithstanding that the importations from abroad have been on an extensive scale, and that there is every prospect of full average importations during the remainder of the year. The fact is that the last crop of English wheat, now greatly reduced in quantity, is still arriving at the various markets in such poor condition that a heavy admixture of foreign qualities has become necessary to make saleable flour. This state of things must continue for some months; hence, the whole of our importations will be required for consumption.

There has been rather an extensive business doing in barley and oats, at late rates; whilst other descriptions of spring corn have changed hands at full prices. In the value of flour very little change has taken place.

Throughout the continent, wheat has sold at high quotations, and the supplies brought forward have not increased to any extent. From Odessa, Taganrog, &c., heavy shipments of wheat are being made to England, and there is some quantity on passage from California. The state of the American markets, almost generally, is such that no exports of produce can be made to this country, except at a loss. France, which holds very little wheat for the time of year, is likely to cease exporting altogether until after harvest. We shall, therefore, be chiefly dependent upon foreign supplies for some considerable time.

Much depression, caused in some measure by the enhanced duties levied upon woollen goods in America, has prevailed in the wool trade, and prices generally have given way. The supply of colonial wool now on hand for the next public sales is equal to nearly 140,000 bales; and it is anticipated that the total quantity to be brought forward will exceed 190,000 bales. English wool has given way about 1d. per lb., and the demand for export has fallen off considerably, as most of the continental houses are well in stock. In the manufacturing districts the quantity of English wool on hand is limited.

The supplies of potatoes on sale in the metropolitan markets have fallen off to some extent. Prices, therefore, have advanced, and the best qualities are now worth 180s. per ton. At this period last year, the highest quotation did not exceed 100s. per ton. Apparently, therefore, the quantity of really sound potatoes in the hands of the growers is limited.

Hay and straw have come forward slowly. The trade, however, has been somewhat heavy. Meadow hay has sold at from £2 15s. to £4 15s., clover £4 to £5 12s. 6d., and straw £2 to £2 6s. per load.

For the time of year the pastures are tolerably full of grass, and there is every prospect of an abundant crop of hay.

The small supplies of wheat brought forward in the Scotch markets have been disposed of at enhanced rates. Barley and oats have changed hands slowly, on rather lower terms. Most other kinds of produce have sold at full quotations. The shipments of produce to the South have been trifling.

The Irish markets have been scantily supplied with wheat, yet the demand for it has ruled inactive, at late quotations to a slight advance. Very little change has taken place in the value of spring corn. The shipments of produce have been seasonably good.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Owing in a great measure to the large quantities on sale in the dead markets, the demand for beasts in the Metropolitan Cattle Market has been somewhat heavy, and prices have been with difficulty supported. The general quality of the stock has been very prime, especially from Norfolk and Scotland. The average quotation for the best Scots and Crosses has been 5d. per 8lbs.

The numbers of sheep brought forward have been only moderate; but most breeds have come to hand in full average condition. On the whole, the trade has been steady. The best Downs and half-breds, in the wool, have sold at 6s.; out of the wool, 4s. 10d. to 5s. per 8lbs.

Lambs have met a fair inquiry, at from 7s. to 8s. per 8lbs. The numbers brought forward have been moderate.

Calves have commanded high quotations, with very moderate supplies on offer.

The pork trade has continued in a very inactive state. Prices, however, have been supported.

The imports of foreign stock into London were—

	Head.
Beasts	6,228
Sheep and lambs	26,328
Calves	1,063
Pigs	665
Total	34,284
Imports in April, 1866	36,925
„ 1865	27,816
„ 1864	15,442
„ 1863	16,021
„ 1862	9,616
„ 1861	11,119
„ 1860	10,489
„ 1859	8,888
„ 1858	5,998
„ 1857	4,814
„ 1856	1,924
„ 1855	4,253
„ 1854	4,760
„ 1853	14,787

The total supplies exhibited in the Metropolitan Market were as follows:

	Head.
Beasts	16,250
Sheep and lambs	113,770
Calves	977
Pigs	1,805

COMPARISON OF SUPPLIES.

April.		Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1866	......	11,350	—	120,180	208	3,331
1865	......	19,670	532	92,850	1,279	2,602
1864	......	22,200	497	107,010	1,596	3,100
1863	......	19,290	491	113,060	1,341	2,540
1862	......	19,000	515	110,500	1,077	3,055
1861	......	17,140	510	102,630	497	2,662
1860	......	18,512	489	114,450	1,848	2,140
1859	......	16,850	390	110,114	420	1,990
1858	......	17,950	400	104,380	1,332	2,097
1857	......	18,601	460	92,810	1,240	2,025

The comparison of home supplies stands thus:

From—	April. 1865.	April. 1866.	April. 1867.
Norfolk, Suffolk, &c.	8,000	2,890	6,200
Other parts of England	2,000	500	2,150
Scotland	1,617	1,371	670
Ireland....................................	350	680	3

Beasts have sold at from 3s. 4d. to 5s. 2d.; mutton, 3s. 6d. to 6s.; lamb, 7s. to 8s.; veal, 4s. 6d. to 6s.; and pork, 3s. to 4s. 2d. per 8lbs. by the carcase.

COMPARISON OF PRICES.

	April, 1863.	April, 1864.
	s. d. s. d.	s. d. s. d.
Beef from............	3 2 to 4 10	3 4 to 5 0
Mutton	3 6 to 5 8	3 8 to 6 0
Lamb	6 8 to 8 0	6 0 to 7 8
Veal	4 0 to 5 4	3 4 to 5 6
Pork	3 4 to 4 6	3 6 to 4 6

	April, 1865.	April, 1866.
	s. d. s. d.	s. d. s. d.
Beef from............	3 6 to 5 2	4 0 to 5 6
Mutton	4 0 to 6 0	4 6 to 7 0
Lamb	6 8 to 8 4	6 8 to 9 0
Veal	4 8 to 5 8	5 4 to 6 4
Pork	3 6 to 5 0	3 10 to 5 0

Newgate and Leadenhall have been well supplied with meat, which has moved off slowly, as follows: Beef from 3s. 2d. to 4s. 6d., mutton 3s. 6d. to 4s. 10d., lamb 6s. to 6s. 8d., veal 4s. to 5s. 8d., and pork 2s. 10d. to 4s. 4d. per 8lbs. by the carcase.

ISLE OF ELY.

Winter lingered long, and the end was more severe than the beginning. The snows and frosts of March were heavy and keen; and it is seldom we experience so much inclement weather so late in the season; and April, although giving us a higher temperature, has been unusually tempestuous. Gale has succeeded gale in quick succession, accompanied by heavy showers of rain, and yesterday by an electrical display. The thunder was heavy, and the lightning vivid; and hail showers, rain, and wind threatened to break or drive in all the windows of our houses. Spring work on the farm has consequently been greatly retarded; and we now require a few weeks' fine weather to enable us to bring up the arrears. The wheats on fen lands are generally looking healthy, and bid fair to yield an average bulk of straw, more especially on the gravelly soils; and should we be spared frosts succeeded by hot sunny days, for another month or six weeks, we may confidently hope to reap an abundant crop; but these lands are so fickle, and susceptible to injury from so many causes, that one is scarcely justified in venturing to give any very decided opinion until the crop is matured and ingathered. On the high lands the slugs, in many instances, have done serious mischief, too serious to be repaired, although in several cases fields have been either partially or wholly re-sown. Spring seeding is much of it done now, but it has been a slow and tedious affair. The patience of fen farmers has been severely tested. Lands are now, as rapidly as circumstances will permit, being prepared for mangels and kohl-rabi, the latter being a crop increasingly grown. Sheep-grazing during the winter has been a most unprofitable business. Wool and mutton are both declining in value, and many sheep will lose from ten to twenty shillings per head for wintering. The corn trade has passed through a stage of extreme dulness, but is now exhibiting symptoms of revival, and prices are tending upwards.—April 15th.

NORTH NORTHUMBERLAND.

During the many years that we have been spared by the will of a kind Providence to report progress of the rural aspect from our varied Border-climate, we have hitherto avoided doing so in stormy weather, and *vice versá* on any sudden change to extra fine, lest we should give any gloomy or too bright a colouring aspect to future speculation. Since we last reported (1st February) the month was generally fine, with the exception of violent westerly gales of winds, which swept the snow clean from the mountain range: the rivers often flooded, and on low cultivated districts clouds of dust at intervals rendered out-door traffic rather unpleasant. March came in with hoar frost at nights, and hot sun during the first three days, followed by a change to cold southerly winds, and up to the 23rd was frosty with bitter cold wind, alternating from S.E. to N.E. Heavy flights of snow-ice every morning, two to three inches thick, on stagnant pools. We believe few are living that can recollect three weeks of more intense cold during the third month: the 23rd day quite a hurricane of rain from S.W., since which the atmosphere has been more spring-like, and very little wet has fallen up to this day, when we have a quiet spitting rain. April has been rather a windy month so far: once or twice the mountains have been laid white, but the westerly winds succeeding soon showed the black heath. Feed for sheep on the large grazings was by the end of March very scarce, causing the careworn flockmaster much anxiety, moving them to the low, sheltered vale of the Tweed, where some thousands of acres of grass parks are at that early period annually let for the season by the hammer; consequently the "let" has generally been very high, realising quite a hundred per cent. above what such lands could obtain broken up for tillage. Whether wool and mutton will continue to pay such excess is a question. There can be no doubt the high price netted for two seasons past has stimulated breeding and feeding to a very great extent, while the present state of our butcher markets foretell supply in excess of demand. Wool also seems to have reached the highest figure per pound for a great length of time. Fat beeves, which were expected to be scarce, are on the contrary in good supply, and will leave a small margin, if any, to the grazier. One cause is evidently the high price of feeding stuff; while every one that holds sheep or cattle have been feeding for the shambles. We therefore see no cause for the million fretting about supply. On the tillage-farm the last three weeks of fine weather have enabled the diligent occupier to get well forward with all field labour. Oats are making quick and early braird. Barley and grass seeds sown in extra fine trim. The wheat plant, which the last week of March had a miserable appearance, is recruiting strength, and, although backward for the time of year, promises on all dry soils a full plant: it is too soon, however, to form any speculative opinion as to future progress, so much depends on elementary influence. We can only hope the cold withering winds for the season are exhausted, and there will be enough for man and beast.—April 13th.

WEST OF SCOTLAND.

The delightful and almost summer-like weather of February was followed up in March by weather of the exactly opposite character. The frost was so intense that the plough was locked out for three entire weeks. We have seen many a time frost in March so hard that the plough could not run in the forenoon; but the heat of the sun generally softened the land so much as to render it capable of being ploughed from probably mid-day. This season there was no such facility, as the frost continued from morning till night, and from night till morning, until it was not less than 10 inches deep. When the frost gave way, rain followed, and, with but few intervals of intermission, has continued ever since, and up to the date on which we write there is not much appearance of settled weather. Farmers are now seriously anxious about this state of things, as many who farm extensively have not a single handful of spring-corn sown yet, and even the most pushing and favourably-situated have got but little done. A beginning has been made with potato planting; but it is only a beginning, it being only in exceptional situations that the land is in a suitable condition for drilling. February-planted potatoes will, in many cases, have to be replanted, the frost having destroyed them completely. The wheat plant is in general thin: the hard frost at night, and bright sun during the day, having had a most damaging effect upon it. The result is, however, as far as can be judged at present, not so bad as was anticipated during the continuance of the frost. Keep of all kinds is scarce and dear. Rye-grass hay, £7 10s. a ton ; meadow hay, from £5 10s. ; oat straw, £5 ; and wheat straw, £4 12s. 6d. ; the purchaser having in most cases to draw it himself. Store cattle are very dull of sale, and sheep have experienced a very severe check, some sorts realizing little more than half the price ruling this time twelvemonths. Breeding ewes purchased at Michaelmas have lost from 10s. to 15s. a-head and the wintering, no very pleasant matter for a hard-working rent-paying farmer. In the face of all these drawbacks and vexatious losses, grass parks have rouped very high this season, being from ten to thirty per cent. over last year, and in some instances considerably more.—April 13th.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BALCOMBE FAIR.—There was a fair show of tegs, which realised from 33s. to 37s. per head, and a considerable number of quarter-old store pigs, which were disposed of at prices ranging from 20s. to 25s.

BANBURY FAIR.—Beef in short supply, and trade very slow; mutton-trade better than last fair, store tegs very slow trade. Beef 4s. 8d. to 5s., wethers 4s. 4d. to 4s. 8d. (stores), ewes 4s. to 4s. 2d. (shorn), wethers in wool 5s. 8d., ewes in wool 4s. 8d., veal 5s. 6d. to 5s. 8d. per stone. Bacon and pork 8s. 6d. to 9s. 6d. per score.

BARTON PIG MARKET.—A good supply at a reduction of 1s. to 2s. per head; for small stores 2s. to 3s. ; bacon pork, 6s. to 6s. 6d. per stone.

BLAENAFON FAIR.—The live stock comprised only a few horses and pigs, and very few of them changed owners.

BODMIN FAIR.—About 60 sheep were penned ; sale dull. Fat ewes and wethers 8½d. to 9d., hoggs 42s. per head. There were no bullocks, but a few cows and calves.

BOSTON SHEEP MARKET.—There was a good supply of fat sheep, and trade was decidedly better than last week. Prices ranged from 6d. to 6½d. per lb. The show of hoggs was very large, and though prices were about the same as last week, buyers were more numerous, consequently trade was more brisk.

CAISTOR FAIR was numerously attended, but trade was exceedingly gloomy and depressed; a great portion of the sheep remained unsold at noon, and a clearance was only effected as it were at the eleventh hour. The reduction in prices for those obtained at this fair last year was fully £1 per head; the average figure was about 50s. Mr. Edward Davey's pen of 200 sold at 62s., and Mr. Smith's 250 at 61s. per head. Mr. Willows' hoggs were sold at 55s.

CHESTER HORSE FAIR.—But few animals were exhibited ; business on the whole was dull. First-class horses were bargained and sold for, as usual, in stables. Many of them were got rid of without any "trotting."

COUPAR-ANGUS MONTHLY MARKET.—The supply was very limited, sales were slow, and prices declined considerably. The price for fed cattle cannot be quoted at more than 9s. 9d. to 10s. 6d. per stone.

GRANTHAM FAT STOCK MARKET. — A slight improvement in the price of mutton took place, 5½d. to 6½d. being the average price. There was a fair show, and a good sprinkling of buyers.

LINCOLN FAT STOCK MARKET.—A fair show, and prices slightly higher, small sheep making 6½d. to 7d. per lb. out of the wool.

THE THERROW HERD OF HEREFORDS.—At the recent sale of this herd of Hereford cattle (as conducted by Mr. Alfred Edward), some good prices were realised; among which were the following: Lady Byron and her heifer calf, 50 gs.; Emperor, bull-calf, six months old, 22 gs.; Fairwater, 38 gs.; Rosebud, 31 gs.; Alexandra 28½ gs.; Lord Hastings, 59 gs.; Patent 43 gs.; Master Butterfly, ten months old, 52 gs. Some lots were reserved, including a young bull, to form the nucleus of a new herd. Several of our best-known breeders were among the purchasers. The Therrow herd is a very old one; and of the hundred head offered, all, with one exception, went back to those celebrated sires Newton, Sir David, and Old Sovereign. In 1815 eight pairs of working oxen were sold at 100 guineas the pair; and since that time cups and prizes to the value of several hundred pounds have been won by the representatives of the herd at the Royal, French International, and many other meetings. —*Hereford Times.*

SALE OF THE RAVENSDEN SHORTHORNS.—The sale of Mr. Wythes' stock at Ravensden, near Bedford, took place on Wednesday, April 10, under the conduct of Mr. Strafford ; but the prices, as has generally been the case this spring, did not rule high. In fact, it was considered that the several lots did not reach anything like their value. This was more particularly the case with the old cows ; but the auctioneer did somewhat better with the young things, the sixty-five making in all nearly £1,600, at an average of about £24 each. Eleven of the best lots were purchased by Mr. Trethewy for Lord Cowper, who is establishing a Shorthorn herd at Penshanger ; and Mr. Wortley, from Oakham, also secured several "bargains," despite there being a very good attendance from Cambridgeshire, Essex, Huntingdonshire, Northamptonshire, and nearer home. However, it is expected that business will be better by May-day, when the Grand-Duchesses come again to the hammer.

SALE OF THE ARDFERT SHORTHORNS.—The sale took place on April 16, conducted by Messrs. Ganly, Sons, and Parker. Redlight, a two-year-old son of Lamp, was knocked down to Mr. T. Sheehan, a tenant of Mr. Crosbie's, at 21¼ gs. ; Crown of Florence, a roan yearling, by Castlegrove out of Florence Diadem, Mr. T. Enright, Castle Matterix, Rathkeale, 20 gs. ; Crown of the Grove, by Castlegrove, dam Diadem by Admiral, dam of Crown of Athelstane and Crown of Lothian (Ganly Cup winners), Mr. W. R. Meade, for Mr. A. F. Foster, Garretstown, 30 gs. ; Lord Leicester, roan, by Castlegrove, dam Queen Bess by Lamp of Lothian, Mr. Goodman, gentleman, Ballyhorgan, 26 gs. ; Duke of Ancaster, roan, by Castlegrove, dam Lady Bertie by Admiral, Mr. T. Sheehan, 25 gs. ; Squire of Stoke, white and red, by Castlegrove, dam Beam of Beauty by Lamp of Lothian, Mr. Alcock, county Kilkenny, 25 gs. ; Rupee, red and white, by Castlegrove, dam Queen of the East by Nobleman (18,457), Mr. Rosford, Bandon, 20¼ gs. ; Castlegrove, Mr. Scannell, butcher, Tralee, 32 gs. ; fat heifer, Mr. Kenny, Listowel, 23 gs. ; fat heifer, Mr. Pat Horan, Tralee, 21¼ gs. ; fat heifer, Mr. Fitzgerald, Knightstown, Valencia, 21½ gs. ; two two-year-old heifers in-calf, Mr. Haynes, Mallow, 16 gs. each ; three two-year-old heifers in-calf, Mr. Scannell and Mr. Slattery, 13¾, 18, and 15 gs.—*Abridged from Irish Farmers' Gazette.*

SALE OF THE SITTYTON SHORTHORNS.—Messrs. Cruickshank's bull calves comprised thirty lots, of which twenty-seven were sold. The highest priced calf, Grand Prince, fetched £94 10s., sold to Mr. Marr, Cairnbrogie. The next highest priced was Valiant, purchased by Mr. Scott, Glendronach, for £71 8s. Dr. Robertson, of Hopewell, Tarland, bought Knight Errant, a May calf of last year, for her Majesty, at £40 9s. The average price realized was £49 7s. Mr. Cruickshank afterwards sold by private bargain a red bull, ten months old, by Prince Imperial, to Mr. Longmore, Rettie, for 150 guineas.

SALE OF MR. MIDDLETON'S SHORTHORNS.—The sale of Mr. Middleton's herd of Shorthorns took place at Cutteslow, Oxford. It consisted of about 45 head of bulls, cows, and heifers, bred during twenty years from stock descended from that of Earl Ducie, traceable to Mr. Wright's Laurestina, from purchases at Earl Spencer's Chilton sale, and that bred directly from Mr. R. Colling's Cowslip. The sires were formerly of the Wiseton, while latterly they have been of the Kirklevington blood. The following are some of the best prices:—Cow and heifers: Prima Donna (Mr. Mason, Eynsham), £38 17s. ; Clara (Mr. Dickers, Thame), £31 10s. ; Rosette (Mr. Walter, Bearwood) £37 16s. ; Wicked Duchess (Mr. Pope, Dorsetshire) £43 1s. ; Merry Heart (Mr. Barton, Kidderminster) £31 10s. ; Criterion (Mr. Mumford, Thame) £44 2s. ; Philomel (Mr. Barton, Kidderminster) £37 16s. ; Favourite (Mr. Barton) £34 13s. ; Rose Unique (Mr. Walter) £35 14s. ; Gem (Mr. Barton) £31 10s. ; Janette (Mr. Pope, Dorsetshire) £31 10s. ; Rosalie (Mr. Walter) £29 8s. Bulls : Here's a Bumper (Mr. Hutt, Water Eaton) £29 8s. ; John Bull (Mr. Gale, Cuddesdon) £30 9s. Mr. Strafford was the auctioneer.

SALE OF THE HON. MR. LASCELLES'S SHORTHORN HERD.—Good prices were realized at Harewood on Thursday, March 21, and the result of the sale is understood to be in all respects satisfactory, both to seller and buyers. The latter, certainly, are not likely to be disappointed by any falling-off in the appearance of the animals they have chosen, for the herd of the Hon. G. E. Lascelles has always been kept in a condition of usefulness for dairy-purposes, and the expense of rearing young stock at the Moor Hill Farm has never exceeded the limit of bare necessity. The heifers, therefore, although recently improved a little for the occasion, did not display the ample expansion and rotundity of frame which characterise animals of their blood when allowed a fair measure of their natural food. The initiated eye, however, could readily detect the impression stamped by Warlaby and Wetherby bulls. Mr. Carr, in conducting the business of the day, drew attention to the personal merits and valuable ancestral belongings of the shorthorns composing the herd; and the recognition, no doubt, of his experience and judgment went far to enhance the success of the sale. Twelve of the females made an average of upwards of £51 each; and the entire number, 27, of cows, heifers, and heifer-calves realized £1,067 17s., averaging £39 10s. The ten bulls and bull-calves brought £404 5s., the average being £40 8s. 6d. The total sum produced by the sale was £1472 2s., and the general average £39 15s. 8d. Among the purchasers were Lord Stourton, Messrs. Wainman, Aylmer, Richards, Gomersall, Bracewell, York, Stables, Cooke, Balfour, and Rawlinson, and Sir. G. Wombwell. Mr. Torr, of Aylesby, presided at the luncheon.

SALE OF HEREFORD CATTLE AND SHROPSHIRE SHEEP.—The sale of Hereford cattle and Shropshire sheep belonging to Mr. Meire took place at Berrington on Wednesday, March 20, when Mr. Meire's reputation as a breeder of both sheep and cattle was well appreciated, and satisfactory prices realised. The first lot of the Herefords, "Belle" and her heifer calf, was sold to Mr. Harding, of Bicton, for 33 guineas. "Planet" and her bull calf were purchased by Mr. Matthew Williams, of Dryton, for 59 guineas. "Spicey" and her calf by the same gentleman, at 41 guineas. "Sausage" and ox calf by Mr. Preece, for 30 guineas. "Spangle" and calf by Mr. Williams, at 29 guineas. "Comfort the Second" and heifer calf by Messrs. Horton and Loat, for 37 guineas. "Belinda" and heifer calf by Messrs. Meire and Growcott, for 25 guineas. "Silver the Second" with three days' old bull calf, for 28 guineas. "Pet" (a daughter of Planet) with heifer calf, by Mr. Knight, of Downton Castle, for 36 guineas. "Samlet" (a daughter of Sabrina, from Cronkhill Beauty) with her heifer calf, made 30 guineas, to Messrs. Harding and Lort. "Violet" (three years old) with her bull calf, at 56 guineas, to Messrs. Bowen and Jones, and Mr. Sessions, of Hampton, Herefordshire. Mr. Robert Groves, the in-coming tenant, of Berrington, bought "Comely the Third," for 24 guineas. The younger heifers realised as follows: "Sweetmeat," 22 guineas; "Pearl," 26 guineas; "Saucy," 20 guineas—all to Messrs. Bowen and Jones. "Plum" (a daughter of Planet), 30 guineas, to Mr. Harding, of Bicton. "Dainty, 21 guineas, to Mr. G. T. Forester. "Star" (a daughter of Planet), to Mr. Williams, of Dryton, 25 guineas. The other yearling heifers average about 17 guineas each. The whole of the yearling steers were purchased by Mr. Heath, of Ludham-hall, Norwich, who has won two gold medals with steers bred by Mr. Meire. The young stock bull "Samson" was purchased by Mr. Pugh, of Sutton, for 32 guineas; and the twelve-months-old calf "Bullfinch" (a son of Confederate and Sabrina), by Mr. Jarvis, of Upton Magna, for 47 guineas. The best dairy cow reached as high as 30 guineas; and the best fat cow 29 guineas. The ewes reached nearly £5, and the rams about £12 per pair, one single sheep making 12 guineas. The breeding pigs reached as high as £9 each. Mr. W. G. Preece conducted the sale, as usual.

THE SUTTON (YORKSHIRE) HORSE SHOW.—This show, held on Thursday, March 28, was even better than that of last year, both with regard to the number and the quality of the horses exhibited. The judges were Mr. Stephenson, Bushby Hill; Mr. J. Ingram, Wood Hall; and Mr. Harper, Lindley Hill, Leven. The following are the awards: Stallion for getting hunters—first prize, £5, Mr. Holmes (National Guard); second, £2, Mr. Shaw (Fingal). Mr. Goodlass (Guicowar) and Mr. W. Hudson (Picador) commended. Ben Webster, Alchemist. Snowdon, Dunhill, Spoonstealer, and Norwood were also there. Coaching stallion—first prize, £5, Mr. Northgreave (General Picton); second, £2, Mr. Bell (Roland). Herod, General Johnson, Young Windham, and General Havelock were also exhibited. Roadster stallion—first prize, £5, Mr. Brown (Shakespeare); 2nd, £2, Mr. W. Smith (Young Charley). Mr. Hall (Merry Legs) and Mr. Gibson (Achilles) commended; Mr. Hart (All-fours) highly commended. Sir Harry and Nimble Deer were also shown. Stallion for agricultural purposes—first prize, £5, Mr. Marshall (Great Tom of Lincoln); second, £2, Mr. Lamplough (Duke of Wellington). Mr. Tutton (Active) commended. Mr. Humphrey's Napoleon, Mr. Pickering's Clodcrusher, Mr. Cole's Pride of the East, Young Duke, and Magnum Bonum were also shown and commended. Roadster mare or gelding, above fourteen hands high—first prize, £2, Mr. Bröchner (mare). Mr. Rodmell (horse), Mr. Shaw (mare), Mr. North (mare), Mr. Bovil (nag), Mr. Rodmell (nag), Mr. Holmes (mare), and Mr. Jackson (nag) were all commended. Ponies, under fourteen hands—first prize, £2, Major Constable.

SALES OF SHORTHORNS IN SCOTLAND.

Mr. Bruce, Broadland, had his usual sale of pure bred shorthorned cattle on Wednesday, March 20. There was a very large attendance, many gentlemen from a distance being attracted by the stock, and all the agriculturists of the district who were in the market being present. The stock were of very fine quality, perhaps the finest as a whole that Mr. Bruce has yet offered. The bidding was spirited throughout, and very fair prices were obtained. The average for the ten bulls sold was £39 5s. 5d., and the average for the six heifers £30 16s. The total proceeds of the sale amounted to £623 14s. The following are the prices obtained: Bulls—The Laird of Logan, roan, calved Feb. 11, 1865, by Signet Seal, to Mr. Baillie, 31gs.; Baron, dark roan, calved Feb. 27, 1865, by Signet Seal, to Mr. James Stewart, 39gs.; Rob Roy, roan, calved March 27, 1866, by Signet Seal, to Mr. Stables, 36gs.; Prince George, roan, calved March 28, 1866, by Signet Seal, to Mr. Cruickshank, 54gs.; Washington, white, calved April 1, 1866, by Signet Seal, to Mr. Grant, 40gs.; Claverhouse, roan, calved April 6, 1866, by Signet Seal, to Mr. Reid, 18gs.; Red Gauntlet, red, calved April 22, 1866, by Signet Seal, to Mr. Gray, 37gs.; Sir James, light roan, calved May 14, 1866, by Signet Seal, to Mr. Pirie, 33gs.; Robin Hood, roan, calved May 20, 1866, by Signet Seal, to Mr. Watt, 52gs.: Bismarck, dark roan, calved July 16, 1866, by Scottish Chief, by Silver Medal, to Mr. Mellis, 34gs. Cow—Clara, red and white, calved March 29, 1861, by Tyneside Tom, to Mr. Bruce, 44gs. Heifers—Bessie Lee, roan, calved March 18, 1865, by Signet Seal, to Mr. Findlater, 31gs.; Mattie, white, calved March 22, 1865, by Signet Seal, to Mr. Smith, 38gs.; Rose of Annandale, red, calved April 5, 1865, by Lancaster Duke, by Lancaster Royal, to Mrs. Macwilliam, 28gs.; Princess Imperial, roan, calved March 29, 1866, by Signet Seal, to Mr. Bennet, 29gs.; Lady of the Lake, roan, calved April 8, 1866, by Signet Seal, to Mr. Mellis, 21gs.; May Flower, dark roan, calved May 1, 1866, by Signet Seal, to Mr. Robertson, 29gs.

The annual sale of shorthorns bulls bred by Mr. George Marr took place at Cairnbrogie farm on Thursday, March 20. The following are the purchasers and prices: Cleveland, red with white marks, calved March 18, 1866, by Baron Sebastopol, to Mr. Runciman, 21gs.; Garibaldi, dark roan, calved Feb. 20, 1866, by Valiant, to Mr. Taylor, 29gs.; Prince of Wales, rich roan, calved March 3, 1866, by Baron Sebastopol, to Mr. Andrew Paterson, 30gs.; Grazier, light roan, calved April 2, 1866, by Valiant, to Mr. Peter Innes, 18gs.; Sir Walter, red with white marks, calved March 10, 1866, by Baron Sebastopol, to Mr. James M'Ken, 23gs.; Washington, red and white, calved March 25, 1866, by Baron Sebastopol, to Mr. Bruce, 19gs.; Diamond, red, calved March 24, 1866, by Valiant, to Mr. John Donald, 15gs.; Napoleon, roan, calved March 22, 1866, by Valiant, to Mr. Davidson, 29gs.; Rifleman, red, calved March 18, 1866, by Valiant, to Mr. Ironside, 16gs.; Red Duke, red, calved March 25, 1866, by Baron Sebastopol, to Mr. Henderson, 14gs.; Red Rover, red, calved Jan. 24, 1866, by Valiant, to Mr. Youll, 22gs.; Warlaby, roan, calved March 31, 1866, by Valiant, to Mr. Wilcox, 12gs.; Balmoral, red, calved March 22, 1866, by Valiant, to Mr. Reid, 15gs.; Havelock, red roan, calved April 11, 1866, by Baron Sebastopol, to Mr. Alex. Falconer, 16gs.; White Duke, white, calved March 10, 1866, by Merryman, to Mr. John Ross, 25gs. The fifteen bulls sold at an average of £21 5s. 7d.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

The month of April as a whole has been seasonable, and though often cold and stormy, with much rain, there have been frequent outbursts of sunshine, with some very genial days, so that vegetation has lately been making rapid progress, and the meadows look very promising. But prefaced as the month was by a very stern and wet March, sowing and field work have been only practicable at intervals, and there is very much work behind, especially in the north and Scotland, the frost in the latter country having penetrated ten inches deep. The gaps in the young wheat have been only made up by resowing, while the devastations by slugs and other vermin have been unusually extensive. Stocks getting low, the weather not being so dry as was needed, and rumours of war between France and Prussia on the Luxemburg question prevailing, there has been an upward movement in prices of wheat, say from about 3s. to 4s. per qr., though Easter brought some calm over the trade. If, with the prospect of peace, the difficulty of obtaining adequate supplies before harvest was apparent enough, a French fleet in the Baltic to blockade the ports of Prussia would be no slight aggravation of matters, and we are sorry to incline to the belief in hostilities between these proud and warlike nations, the success of the one and the envy of the other weighing heavily in the scales. California, whence we were expecting 250,000 qrs., it seems has now only that quantity left for shipment, and about half of what has arrived here, say 10,000 qrs., has gone back to New York orders, thence being executed at Liverpool 5s. *under* the limits. Chili may do something for us with a similar quantity, but France is now in receipt of her contributions, and it seems our extra supplies are to come almost exclusively from our Australian colonies, whence perhaps 20 or 25 vessels are now on their way. But the extraordinary length of the voyage is sadly against time, and the comparative scarcity of shipping for large quantities is another item in the account. Our imports in March were in wheat and flour about 583,000 qrs., making the total in seven months about 4,083,000 qrs., leaving our estimated wants for the next five months 4,917,000 qrs., or nearly 5,000,000 qrs., that is about 1,000,000 qrs. per month, with France claiming monthly fully 260,000 qrs. more, all inferior grain being short this year, and farmers and granary keepers holding less than usual. Nothing could be worse than European strife at such a crisis, except a visitation of locusts, which in the western United States, viz., Kansas, has actually cleared off the growing crops from the ground, while northern Georgia is so destitute as to require a relief fund of liberal dimensions at New York to supply the famishing people with maize; this corn also, after a rise of 3s. per qr., has been pretty well used up in London, by a demand for Ireland. We are sorry to write in this strain, and it is plainly the duty of every man studiously to avoid the least waste, both as regards the consumption of man and cattle. The following rates were recently quoted at the places named: White wheat at Paris was worth 68s. per qr., red 66s.; high mixed Polish at Amsterdam, 69s.; Zealand at Rotterdam, 62s.; red wheat at Liege, 66s., at Bruges 62s., at Cologne 61s., mixed at Berlin 61s., fine wheat at Danzic, of second quality, 62s., red at Hambro' 63s., soft wheat at Galatz 47s., inferior at Ibrail 45s., Polish at Odessa 48s., Californian at New York 77s. per qr., spring 61s. 6d. per 480lbs.

The first Monday in London commenced on a moderate English supply of wheat, with liberal arrivals from abroad, principally from the Black Sea and the Danube. The morning's show of samples from Kent and Essex was very small, but the market was heavy, and only a few of the choicest lots went off at the previous Monday's rates. Russian and Baltic red were in very limited inquiry, and to sell would have required an abatement of 1s. per qr., but the best white qualities maintained their value from scarcity. Floating cargoes were fully 1s. per qr. cheaper. The weather having improved, country reports were mostly in unison with those in London; but there were some exceptions, viz., Liverpool, whence large shipments of Californian wheat were made for New York. Birmingham also, as well as Boston, Stockton, and some other towns were 1s. per qr. higher, though the reverse was noted at Bury St. Edmund's, Leeds, and Louth. No change was generally noted in Scotland, Edinburgh and Glasgow repeating former rates. The short supply of Irish wheat at Dublin caused a rise there at 6d. per barrel, but foreign was nearly as dull as in London.

The second Monday had moderate English and large foreign supplies of wheat, about half being from Russia. There was a very limited show of samples fresh up from Essex and Kent, and with many buyers from the northern counties, and a return to rain, with some talk of war, there was a good sale for English qualities at an advance of 1s. to 2s. per qr. The demand for foreign was also increased, more especially for good Russian sorts at 1s. per qr. improvement, the same increase being obtainable on cargoes afloat. The warlike rumours, coupled with the London advance, made some holders of wheat in the country extravagant in their demands, as much as 4s. more per qr. being, in some cases, demanded; but millers were not so apprehensive as to political events, and 2s. per qr. was the highest rise obtainable at Hull, Wakefield, Bristol, Bury St. Edmund's, and elsewhere. More generally, however, it ranged between 1s. and 2s. per qr., and several quiet places did not quote a higher rise than 1s. per qr. Edinburgh and Glasgow were up 1s. per qr. Cork and Dublin were 6d. to 1s. per barrel dearer for wheat, both native and foreign, with an increased demand.

The third Monday opened with only half the previous arrivals of English wheat, and about two-thirds of the quantity of foreign; but among these figured 7,000 qrs. from San Francisco and 2,300 qrs. from Melbourne, constituting about half the returns. There was again very little sent up during the morning from Kent and Essex, notwithstanding the previous advance, and English qualities went off pretty freely at 1s. to 2s. per qr. more money. The foreign demand was good, and all descriptions were fully as much dearer; fine high-mixed Dantzic being very scarce, brought the extreme advance. Cargoes afloat recovered from the previous depression, and were up 2s. per qr. Dunstable, Ipswich, and Wolverton this week were about 3s. per qr. higher, and 2s. was a common improvement, as at Boston, Wolverhampton, Lynn, Salisbury, Hull, Gainsborough, Newcastle-on-Tyne, and other places, the lowest rise being 1s. per qr. In Scotland the improvement was about equal to that of London. Dublin was 6d. to 1s. per barrel higher for native and foreign qualities.

The fourth Monday's returns showed a small English but liberal foreign arrival—about half from Dantzic. There were very few fresh samples during the morning from Kent and Essex; but the late rise, coupled with the fact that it was Easter Monday and fine weather, very much diminished the demand for English Wheat, which only sold slowly at the previous Monday's rates. The foreign trade was influenced in the same way; but many holders, thinking that the rumours of war had an air of seriousness in them, were not inclined to push business by making offers on lower terms; so prices remained as previously. Floating cargoes up to Friday had sold at advanced rates; but there was no improvement on this day.

The arrivals in the port of London for four weeks were 17,150 qrs. English, 123,470 qrs. foreign wheat, against 19,996 qrs. English, 62,319 qrs. foreign, for the same period in 1866. The London averages commenced at 64s. 7d., and closed at 66s. 4d. per qr. The general averages began at 59s. 9d., and closed at 60s. 9d. The four weeks' imports into the kingdom were 2,929,792 cwt. wheat, 238,664 cwt. flour.

The flour trade, without being brisk, has been very steady at every market but the last, showing a moderate rise, making the gain 2s. to 3s. per sack, and it has been the same with foreign qualities, prices being low as compared with wheat; but town millers have not raised prices, the top quotations having stood steadily at 57s. per sack. The French markets have fluctuated too much to place any dependence on them for supplies. Spain promises little, and America next to nothing, so much will depend on the quantity manufactured at home. The supplies of London for four weeks were 71,876 sacks English, 12,101 sacks 132 barrels foreign, against 82,166 sacks English 8,527 sacks foreign in 1866.

Barley has varied. The malting season being near its close, the best descriptions of British and foreign have been declining—the former 1s. and the latter about 2s. per qr.; but there was some reaction on the third Monday, more especially in grinding sorts—say, to the full extent of 1s. per qr., our own stocks being very low in the country, and there being but little in the London granaries, while the great advance in maize has thrown the demand for pig-feeding almost entirely on this grain. We may therefore from its scarcity see feeding barley dearer before harvest; but there is no chance that malting sorts will regain their previous value. The imports into London for four weeks were in British qualities 6,866 qrs., in foreign 57,719 qrs., against 8,314 qrs. British, 58,210 qrs. foreign in 1866. The malt trade has been quiet, with prices unaltered.

Fine oats have gained about 1s. 6d. to 2s. per qr. in the four Mondays reported, and inferior sorts fully 1s., the supplies till the last week being far less than expected, and there scarcely having been any received from Scotland or Ireland. The upward tendency was, however, checked on Easter Monday by the quantity reported, though not so as to lower values, fine qualities still being scarce and in constant demand, with but very few forthcoming from our own resources. The imports in four weeks were 5,575 qrs. English, 841 qrs. Scotch, 320 qrs. Irish, and 150,040 qrs. foreign, against 3,730 qrs. English, 1,789 qrs. Scotch, 5,075 qrs. Irish, and 114,264 qrs. foreign for the same period in 1866. This grain, we think, must continue dear till the Russian supplies arrive.

Maize during the month, with light supplies and a sweeping demand for Ireland, has risen fully 2s. to 3s. per qr.; but in proportion as prices have risen, the home inquiry has slackened.

Beans on the first Monday were somewhat shaken in value (say, 1s. per qr.) by larger supplies, both English and foreign, than had been received for some time previously; but, as the arrivals moderated, they about regained the decline which was lost. The demand for this grain naturally lessens with the approach of summer; but with low stocks, a poor crop, and very moderate expectations as regards foreign supplies, we do not see much chance of reduced rates.

Very few peas have come to hand, and it would seem that not many have been wanted, though towards the close of the month there was enough demand to raise prices 1s. to 2s. per qr. We can only account for the short supplies by believing that they have been used by farmers for their own consumption. The imports in four weeks for London were 712 qrs. English and 2,947 qrs. foreign, against 1,181 qrs. English and 665 qrs. foreign in 1866.

The supply of Linseed this month shows a great improvement upon March; but the stocks being very low previously, there was no room for any reduction in the rates, and the tendency was upwards at the close of the month.

The seed trade, with occasional fine days and growing weather, has lately shown more activity, cloverseed and other seeds having experienced a fair inquiry, but not at remunerating rates. Early buyers have been considerably disappointed by the unusual roughness of the season. A few tares were still left on hand, and went off at low and irregular prices.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white... old 65 75...new	58 to	70
,, ,, ,, red ...... ,, 65 71... ,,	58	70
Norfolk, Lincoln, and Yorkshire, red	55	68
BARLEY ....32 to 35....Chevalier, new	38	50
Grinding....32 34....Distilling	37	42
MALT, Essex, Norfolk, and Suffolk ....new	69	73
Kingston, Ware, and town-made .... ,,	69	73
Brown .... ,,	54	62
RYE	32	37
OATS, English, feed 25 to 31....Potato	28	34
Scotch, feed ....23 30....Potato	28	34
Irish, feed, white 22 26....Fine	27	30
Ditto, black ....22 26....Potato	27	31
BEANS, Mazagan ...35 37....Ticks	35	37
Harrow ....37 42....Pigeon	41	46
PEAS, white, boilers..40 42 Maple 41 to 44 Grey, new	38	40
FLOUR, per sack of 280lbs., Town, Households	51	57
Country, on shore ....43 to 47 ,,	48	50
Norfolk and Suffolk, on shore	42	46

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Dantzic, mixed ....63 to 66....old, extra	67 to	74
Königsberg ....62 66....extra	67	69
Rostock ....59 68....fine	67	70
Silesian, red....60 63....white	63	67
Pomera., Meckberg., and Uckermrk. ...red old...	61	66
Russian, hard, 55 to 61...St. Petersburg and Riga	58	64
Danish and Holstein, red	59	62
French, none....Rhine and Belgium	61	66
American, white 00, red winter 00 to 00, spring	00	00
BARLEY, grinding 30 to 33 ....distilling and malting	33	38
OATS, Dutch, brewing and Polands 24 to 31....feed	21	26
Danish and Swedish, feed 24 to 30.... Stralsund...	23	26
Canada 23 to 25, Riga 25 to 27, Arch. 24 to 27, P'sbg.	26	29
TARES, Spring, per qr. ...... small 35 37... large ...	38	40
BEANS, Friesland and Holstein	38	43
Königsberg ....37 to 41...Egyptian	38	39
PEAS, feeding and maple...37 39...fine boilers	38	41
INDIAN CORN, white....38 41...yellow	37	40
FLOUR, per sack, French..44 52...Spanish, p. sack	46	52
American, per brl....27 31...extra and d'ble.	31	34

COMPARATIVE AVERAGES.

	WHEAT.			BARLEY.			OATS.		
Years.	Qrs.	s.	d.	Qrs.	s.	d.	Qrs.	s.	d.
1863	53,858⅝	45	6	20,880⅜	35	8	7,152⅜	21	5
1864	67,595⅞	40	1	25,698⅝	30	9	6,280½	18	11
1865	61,605¾	40	1	22,977⅝	29	6	5,968⅝	22	1
1866	55,193⅞	44	5	19,055¼	37	0	4,678⅛	24	2
1867	48,719¾	60	9	15,098¾	39	9	3,871⅞	24	5

AVERAGES

For the last Six Weeks:	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
March 9, 1867	59	3	41	5	24	1
March 16, 1867	59	4	41	5	24	9
March 23, 1867	59	9	40	5	24	8
March 30, 1867	60	11	39	6	24	11
April 6, 1867	61	2	39	7	23	9
April 13, 1867	60	9	39	9	24	5
Aggregate of the above	60	2	40	4	24	5
The same week in 1866	44	5	37	0	24	2

PRICES OF SEEDS.

BRITISH SEEDS.

Mustard, per bush., brown 15s. to 17s. white	10s. to	15s.
Canary, per qr.	52s.	60s.
Cloverseed, red	52s.	68s.
Coriander, per cwt.	18s.	20s.
Tares, winter, new, per bushel	5s. 0d.	5s. 6d.
Trefoil	22s.	25s.
Ryegrass, per qr.	18s.	20s.
Linseed, per qr., sowing 68s. to 72s., crushing	63s.	66s.
Rapeseed, per qr.	56s.	60s.
Linseed Cakes, per ton	£11 10s. to	£11 5s.
Rape Cake, per ton	£5 5s. to	£5 10s.

FOREIGN SEEDS.

Coriander, per cwt.	18s. to	20s.
Cloverseed, red 50s. to 64s., white	86s.	100s.
Trefoil	18s.	21s.
Ryegrass, per qr.	16s.	18s.

HOP MARKETS.

Mid and East Kent	£8 10	£9 9	£11 11
Farnham and Country	8 10	9 9	11 5
Weald of Kent	8 8	8 15	9 5
Sussex	8 4	8 8	8 15
Yearlings	5 5	6 6	7 10
Olds	2 16	3 15	4 15

POTATO MARKETS.

SOUTHWARK WATERSIDE.

Yorkshire Flukes ... ... per ton	140s. to 180s.
,, Regents ...	130s. to 160s.
Lincolnshire Regents	130s. to 160s.
Dunbar and East Lothian Regents	140s. to 180s.
Perth, Forfar, and Fife Regents	130s. to 150s.
,, ,, ,, Rocks..	120s. to 140s.
French Whites	110s. to 120s.

BOROUGH AND SPITALFIELDS.

Yorkshire Flukes	130s. to 170s. per ton.
,, Regents	120s. to 150s. ,,
Lincolns	120s. to 150s. ,,
Scotch	110s. to 160s. ,,
Foreign	100s. to 110s. ,,

COUNTRY POTATO MARKETS.—Barnsley, Saturday last: Potatoes were scarce, and from 2s. to 3s. per load dearer. Rocks 16s., regents and flukes 18s. to 20s. per load, retail 1s. to 1s. 8d. per peck. Doncaster, Saturday last: A very small supply of potatoes, and buyers being numerons there was a rise in prices, regents making 20s. a load, rocks 14s. to to 14s. 6d., and seedlings 15s. per load of 18 tons. Pontefract, Saturday last: Potatoes 1s. 6d. to 1s. 8d. per weigh. York, Saturday last: The market was better supplied than for some weeks past, and the demand was not equal to the supply. Flukes and round ones for sets were each 13s. to 14s. per tub of 280 lbs.; flukes for the table 15s. to 16s., and round ones for the table 15s. per tub. Both descriptions realised 1s. 2d. per peck retail.

ENGLISH BUTTER MARKET.

Dorset, fine new	118s. to 120s. per cwt.
Middling	100s. to 108s. ,,
Devon	106s. to 110s. ,,
Fresh	10s. to 15s. per doz.

CHESTER CHEESE FAIR.—Upwards of 30 tons were pitched: all the dairies were sold at prices ranging from 55s. to 65s., 75s., 81s., 82s., and one dairy went off at 85s.

CHIPPENHAM CHEESE MARKET.—Doubles 56s. to 62s., prime Cheddar 70s. to 80s., loaves 68s. to 70s., thin 45s. to 56s. per cwt.

GLASGOW, (Wednesday last.)—A small arrival of Cheese this week, and the market well cleared of surplus stock. Business more active at former prices. About 16 tons passed the weigh-house. Dunlop, prime 65s. to 68s., ditto secondary 58s. to 63s.; Cheddars, prime, 68s. to 72s., ditto secondary 64s. to 67s.

POULTRY MARKETS.—Goslings 7s. to 9s., Ducks 3s 6d. to 6s., tame Rabbits 1s. 3d. to 2s., wild ditto 1s. to 1s. 3d., Pigeons 8d. to 1s., each; Surrey Fowls 10s. to 14s., ditto Chickens 8s. to 12s., Barndoor Fowls 5s. to 7s. 6d. per couple; English eggs 7s., French 6s. per 100; Fresh Butter 1s. to 1s. 4d. per lb.; Wild Ducks 3s. 6d., Widgeons 1s. 6d., Plovers 1s. to 1s. 6d. each.

ENGLISH WOOL MARKETS.

Current Prices of English Wool.		s.	d.		s.	d.
Fleeces—Southdown hoggets	per lb.	1	5½	to	1	7
Half-bred ditto	,,	1	7½		1	9
Kent fleeces	,,	1	6½		1	8
Southdown ewes and wethers	,,	1	6		1	7
Leicester ditto	,,	1	[illegible]		1	8
Sorts—Clothing	,,	1	5		1	9
Combing	,,	1	5		1	10½

LEEDS (English and Foreign) WOOL MARKETS, (Thursday last.)—There is no material change in the demand or the price for English wool. Nothing is bought but what is wanted for immediate consumption, and, in most cases, at prices slightly in favour of the buyer. There have been few sales of colonial wool this week, and prices are unaltered. It is hoped that fine spring weather will tend to revive business, which now for some months has been greatly depressed.

WOOL.—France.—The price of wool remains about stationary in France. A certain amount of business has been done at Marseilles in secondary qualities.

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THE FARMER'S MAGAZINE.

MAY, 1867.

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4 lb.	for 20	sheep, price, jar included ……	£0	2	0
6 lb.	30	" " " ……	0	3	0
8 lb.	40	" " " ……	0	4	0
10 lb.	50	" " " ……	0	5	0
20 lb.	100	" " (cask and measure	0	10	0
30 lb.	150	" " included)	0	15	0
40 lb.	200	" " " ……	1	0	0
50 lb.	250	" " " ……	1	3	6
60 lb.	300	" " " ……	1	7	6
80 lb.	400	" " " ……	1	17	6
100 lb.	500	" " " ……	2	5	0

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

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WILLIAM HERAPATH, Sen., F.C.S., &c., &c.,
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Leicester House, Great Dover-street, Borough, London.

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"For JOHN TINGEY, Esq.,
"R. RENNEY.

"To Mr. Thomas Bigg."

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Four Hundred of these Mowers were sold in England for the Harvest of 1866, and were used with great success. The result of competition with other Mowing Machines, including those of Wood, Samuelson, Horneby, Bamlett, Kearsley, and others, proved it to be the LIGHTEST in DRAUGHT of any of them; and at the Melksham Trial, where QUALITY of WORK was specially noted, the work done by it was declared to be the best, and it RECEIVED THREE PRIZES.

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No. 6, Vol. XXXI.] JUNE, 1867. [Third Series.

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AND
MONTHLY JOURNAL
OF
THE AGRICULTURAL INTEREST.

Dedicated
TO THE
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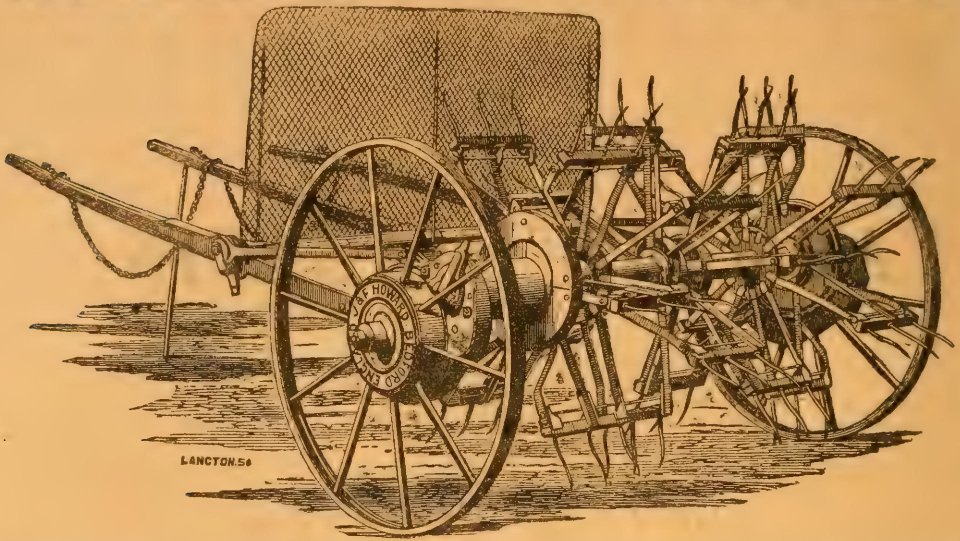
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BOTH STRONG AND SIMPLE,

and the motion can be changed in an instant to the backward or forward action by a simple eccentric movement of the main axle. For adapting the machine to the nature of the crop, a similar movement is also used for raising or lowering the fork barrels to or from the ground. The fork barrels are so arranged as to render

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The New Patent Haymakers, with the above improvements, are manufactured with the greatest care; and, as every part of the machine liable to strain is made of

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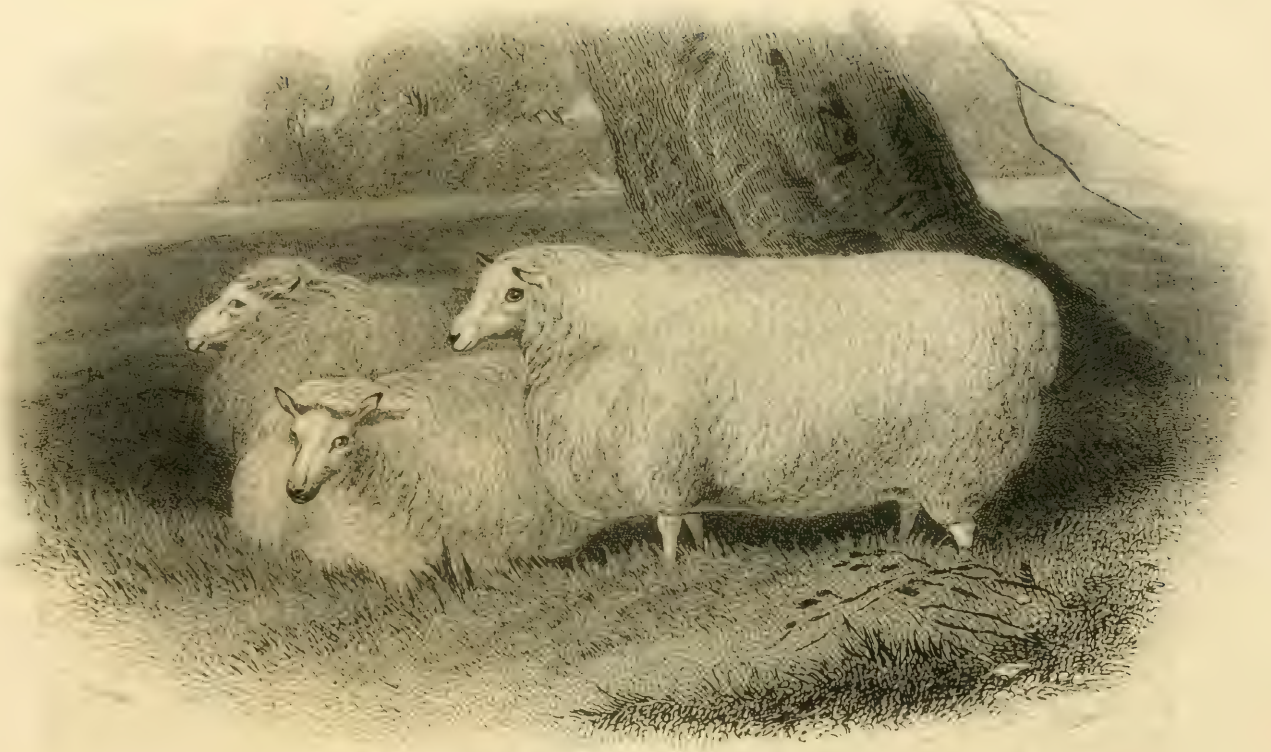

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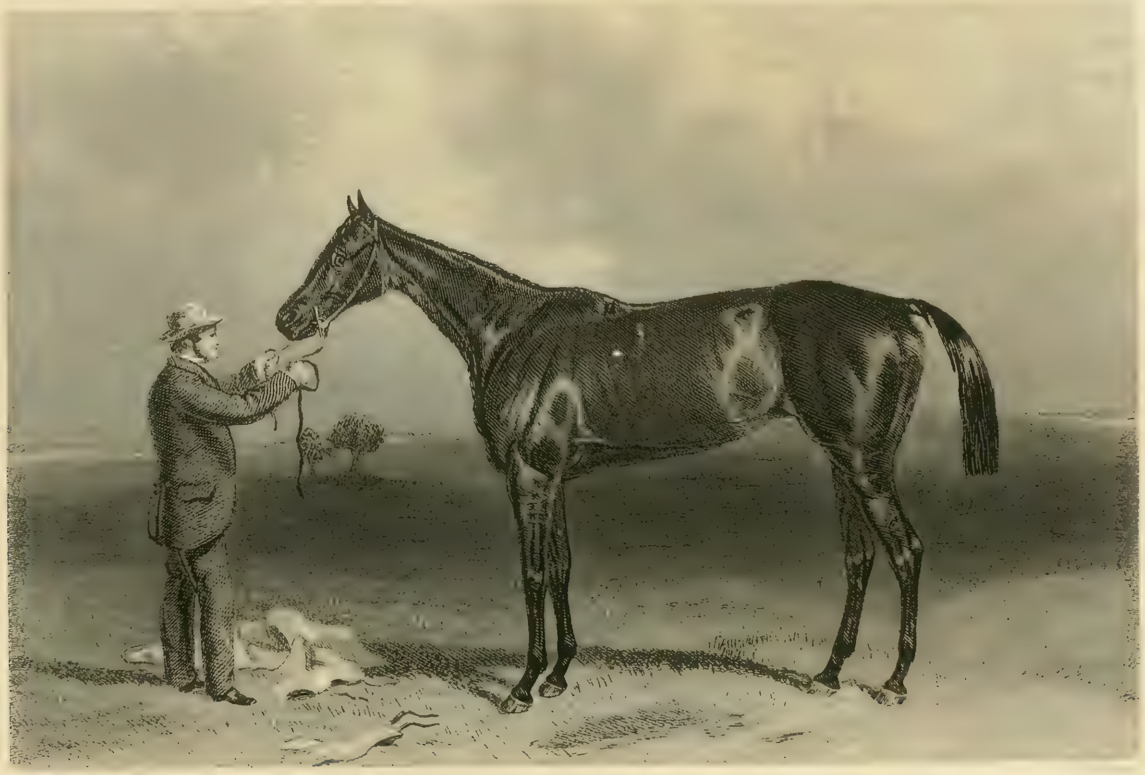

Achievement.

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THE FARMER'S MAGAZINE.

JUNE, 1867.

PLATE I.

LEICESTER WETHERS.

THE PROPERTY OF LORD BERNERS, OF KEYTHORPE HALL, LEICESTER.

We complete the series of Silver Cup winners at the last Smithfield Club Meeting with Lord Berners' Leicesters, which were declared to be "the best pen of Leicesters, Cotswolds, Lincolns, Kentish, or other long-woolled breed in any of the classes." The Keythorpe flock has been very successful at the Christmas Shows, and was here first and first in both classes, beating such well-known exhibitors as Mr. Bradshaw, of Burley-on-the-Hill, Mr. Foljambe, Mr. Walmsley, Mr. Browne, of Spalding Moor, and Mr. Wilmore. The Cup pen showed a deal of breeding, but lacked the weight and substance of some of their competitors.

PLATE II.

ACHIEVEMENT: A THOROUGHBRED FILLY.

THE PROPERTY OF COLONEL PEARSON.

Achievement, bred by Colonel Pearson, in 1864, is by Stockwell, out of Paradigm, by Paragone, her dam Ellen Horne, by Redshank—Delhi, by Plenipotentiary—Pawn Junior, by Waxy—Pawn, by Trumpator.

Stockwell, bred by Mr. Theobald in 1849, is by The Baron, out of Pocahontas, by Glencoe, her dam Marpessa, by Muley—Clare, by Marmion—Gohanna. Stockwell was sold, when a foal, to the late Lord Exeter for 180 guineas, with certain Derby contingencies that never came to anything, although he won the Two Thousand Guineas stakes and the St. Leger. After breaking down Kingston for the Whip as his last performance, Stockwell went to the stud in 1855, during which season he stood at Burghley at a subscription of 30 guineas a mare; but in the autumn of the same year he was sold at the hammer to the late Lord Londesborough for 3,100 guineas. His stock consequently came out as two-year-olds in 1858; and up to the close of 1866, Stockwell was the sire of 136 winners. Amongst these are included Lord Lyon, winner of the 2,000 guineas stakes, the Derby, and St. Leger; Blair Athol, winner of the Derby and St. Leger; The Marquis, winner of the 2,000 guineas stakes and St. Leger; St. Albans, winner of the St. Leger; Caller Ou, winner of the St. Leger; Regalia, winner of the Oaks; Lady Augusta, winner of the 1,000 guineas stakes; Repulse, winner of the 1,000 guineas stakes; Asteroid, winner of the Ascot Cup; The Duke, winner of the Goodwood Cup; and other such good runners as Thunderbolt, Argonaut, Ace of Clubs, Exchequer, Audrey, Bertha, Baragah, Comforter, Camerino, Memo, Balham, St. Alexis, Breadalbane, Prodigal, Westwick, Savernake, and Achievement. Two of his sons, Citadel and Laughing Stock, have also won the 100 guineas premium for thoroughbred stallions. On the death of Lord Londesborough in 1860, Mr. Naylor gave 4,500 guineas for Stockwell, who has since stood at Hooton, where his price has been gradually raised to 200 guineas a mare, with the subscription always full.

Paradigm, bred by Colonel Pearson in 1852, ran Lord of the Isles to a head for the Lavant at Goodwood, but broke down on the Thursday in the same week, and never appeared again. Since then she has done this service at the stud:—

1856. Bay colt, King-at-Arms, by Kingston—sent to the Mauritius.
1857. Bay colt, Man-at-Arms, by Kingston.
1858. Chesnut colt, Rouge Dragon, by Windhound.
1859. Bay filly, Panoply, by Kingston—in Colonel Pearson's stud.

1860. Bay colt, Blue Mantle, by Kingston.
1861. Barren to Hobbie Noble.
1862. Brown filly, Gardevisure, by Vedette.
1863. Bay colt, Lord Lyon, by Stockwell.
1864. Brown filly, Achievement, by Stockwell.
1865. Black filly, Hatchment, by Vedette.
1866. Brown colt, by Vedette.
1867. by King Tom.

All these were bred by Colonel Pearson; and the old mare, "nothing particular" to look at, is still in the Colonel's stud, near Biggleswade, in Bedfordshire. Some of her stock, however, are handsome enough, and the faint-hearted Blue Mantle, for one, was as bloodlike a nag as ever was saddled. The sort, indeed, have pretty generally been soft up to Lord Lyon's advent, about the first of them that ever fairly lived over a distance of ground.

Achievement is a dark brown filly, standing quite fifteen hands three inches high. She has a Stockwell head, very full between the eyes, and with the ears curled back at the points; but "the expression" is good, and altogether prepossessing. She has a powerful neck, with splendid shoulders and extraordinary depth of girth; but she runs up, like many of the sort, very light and waspy in her barrel. She has a fine back, with arched hips, drooping quarters, and powerful, muscular thighs. She has small arms and knees, and is in fact pretty generally light of bone, while she is rather sickle-hocked, and stands with her hind legs right under her. Her pasterns are long and well inclined, and she still retains on the off-fore one the blemish caused by getting her foot over the collar shank when a yearling. As we wrote of her when we saw her at Ascot: "Achievement is really a beautiful filly, with one of the finest forehands ever seen, and as high-bred in appearance as can be, but in this she only takes after the family. As a set-off, she is very light and narrow; and the chief mistake to guard against will be *overmarking her at starting*." It is needless to say how well this opinion has been warranted by the result, as nothing but overmarking her could have brought defeat on Achievement, at any rate as a two-year-old.

Achievement, trained by Dover with Mr. Sutton's horses over those best of Downs at Ilsley, has, however, appeared from the first in her gallant breeder's own colours. She was brought out no less than thirteen times in 1866, opening at Newmarket on Tuesday the 3rd of April, and bringing her labours to a close over the same Heath on Monday the 22nd of October. During the season she started thirteen times, won eleven, and ran second twice.

In the Spring of this year Achievement won the 1,000 gs. stakes at Newmarket, and ran a dead heat for second in the Oaks, the race being won by Baron Rothschild's Hippia.

THE DEW OF HEAVEN.

BY CUTHBERT W. JOHNSON, F.R.S.

The study of atmospheric phenomena has only in modern days been regarded by the agriculturist at its real value. We search in vain, in the works of the early English writers on rural affairs, for any rational observations in meteorology. The very first of these, old Judge Fitzherbert (A.D. 1532) had no ideas beyond advising the farmer to plant or sow in the increase or wane of the moon; and a quarter of a century later Tusser (A.D. 1557) had no other opinion of the atmosphere than that the planets influenced the farmer's crops. Thus he writes:

> " So here by the planets, as far as I dare,
> Some lessons I have for the husbandman's share."

Nearly a century after this, we find Walter Blith (A.D. 1649), one of the most enlightened of the early English authors on agriculture, telling his brother-farmers, when speaking of planting trees: "As for the moon's increasing or declining, matter it not at all; but be sure that what sets are gathered one day may be set the next" ("English Improver," p. 131). Twenty years later (A.D. 1669) old Worlidge speaks of dew, but only as prognosticating the weather to be soon expected: "If dews lie long in the morning, it signifies fine weather; if they vanish early, it presages rain" ("Mystery of Agr.," p. 301).

Of the mother of dew, the insensible moisture of the atmosphere, they knew in those days but very little; and they were utterly ignorant of its vital importance to the vegetable world. And yet we all know that the earliest writers in our possession had not disregarded meteorological appearances. Thus, as I have elsewhere remarked, it may now, according to Maury, be regarded as an established fact that there is "a perpetual upper-current of air flowing from South America to North Africa, and that this volume of air is nearly equal to that which streams to the southward with the north-east trade-winds."

One can hardly read the observations in holy writ without being struck by the remarks of the sacred writers—observations which modern investigators seem often to verify. We are aware how currents of air have been proved to cross each other, and so return back to their sources the streams of air which the "trades" and other winds have withdrawn. Thousands of years since, we find it observed that "The wind goeth towards the south, and turneth about unto the north: it whirleth about continually, and the wind returneth again according to his circuits" (Ecclesiastes i. 6). Job seems to have regarded as a mystery "the balancing of the clouds" (xxxvii. 16); but he was aware of how rain exhausted those clouds (xxxvii. 11); but how that rain was produced out of the cloud, he merely inquires (xxxviii. 28). The smallness and gentle falling of the drops of rain had not escaped his attention (xxxvi. 27).

Modern philosophers once disputed whether dew descended from heaven, or was emitted from the earth. It has long been decided that Solomon was right when he said that the dew "drops down" (Proverbs iii. 20), and, as Zechariah says (viii. 12), "from heaven." There are many other observations scattered through holy writ which seem to be not a little remarkable, when viewed in connection with modern scientific researches. For instance, it is now more than suspected that the sun, with all its planets and their satellites, are *moving* around one vastly larger centre, and that that central sun is very likely to be one of the Pleiades. Job asked, thousands of years ago (xxxviii. 31), "Canst thou bind the sweet influences of Pleiades?"

The insensible vapour, whose birth is in the evaporation from the earth's surface, appears again on the earth in its first and softest way, as dew. Several recent observations on this phenomenon will be full of interest to our readers. We must not forget, as I have often remarked, that the insensible deposition of water from the atmosphere is not confined to the *surface* of the soil. Wherever the atmospheric air can freely penetrate, there the deposition of the dew, under favourable circumstances, takes place. This also often occurs in the interior of the soil, when evaporation is taking place from the surface. The amount of the dew deposited upon the soil has been estimated by Dr. Dalton to be equal to five inches per annum, or about five hundred tons of water per acre. Less dew is usually formed during the first than in the second portion of the night.

The amount of water deposited in dew varies at different seasons and localities. Autumn, as Mr. Steinmitz observes, is remarkable for its heavy dews, owing to the depression of the temperature during the nights. These are sometimes so abundant as to admit of measurement in the rain-gauge. In one night, towards the end of September, Luke Howard got one-hundredth of an inch of water from the dew, and in the last six days of October eleven-hundredths from copious dews and mists.

We must not then forget that dew is only one form in which the aqueous vapour of the atmosphere is deposited on the earth for the service of vegetation. The driest soils contain about 10 per cent. of moisture. We know that when soils are dried in a temperature of 212 deg., and exposed on their surfaces to air saturated with moisture, they absorb very considerable portions of water. Suppose a soil which weighs about 1,000 tons per acre is pulverized so as to be freely permeable by the atmosphere, and that such a soil, after being thoroughly dried, is exposed to the air, then we find from the experiments of Schubler that it will absorb water in twenty-four hours—

If a sandy clay, equal to	26 tons.
If a loamy clay, ,,	30 ,,
If a stiff clay, ,,	36 ,,
If a garden mould, ,,	45 ,,

The inquiry is closely connected with the good effects produced in most soils by deepening and pulverizing them. Well-pulverized soils absorb much more dew than when suffered to remain close. "Sands," observes Mr. Josiah Parkes *(Jour. R. A. S.*, vol. v., p. 132), "appear to be powerful attractors, and in some countries to depend altogether on the nightly deposition of moisture for the support of their vegetation. It is to the copious dews that we have in a great measure to attribute the productiveness of the meadows bordered by rivers. The atmosphere in the neighbourhood of currents of water becomes more highly charged with aqueous vapour than those of the upland. A moisture is deposited from it, in such places on the grasses during the night, in globules of dew; hence the French expression that a river bedews *(arrose)* is more correct that the English one, that it *waters* a country. In India the deposition of dew near to rivulets, when all around is perfectly dry, is very marked." Colonel Sykes *(Trans. Roy. Soc.*, 1850, p. 354) remarks that when at Poona in September and October, if there was no deposition of dew anywhere else, it was yet found on the banks of rivulets and the Mota Mola river; but 15 to 20 feet from the water were the limits of the deposition."

This interesting branch of our inquiry is well alluded to in a very useful and interesting little work just published by Mr. Andrew Steinmitz, entitled "Sunshine and Showers" (Reeve & Co.); a volume which I can safely commend to the perusal of all my readers. He remarks, very truly, that "the quantity of aqueous vapour in the atmosphere is greatest in equal latitudes on the sea-coast; it diminishes in proportion as we advance into the interior of a continent. In Algeria, at the stations on the coast, after the driest and hottest days, immediately the sun has set, the soldier's uniform becomes wet with dew, and in a single night the blades of knives in the pocket become rusted; but at thirty miles from the sea, night exposure is not attended with any inconvenience from the humidity of the air. This rule holds good in the interior of the United States, the Deserts of Africa and Asia, the Steppes of Siberia, and the interior of New Holland. The Deserts of Africa being entirely arid regions present no evaporation; besides, the extreme heat, which is increased by the reflection of the sands, opposes aqueous precipitation, and is one of the causes of the eternal sterility of that country."

The insensible moisture of the atmosphere of our country varies in amount according to the direction of the wind, so that as Mr. Steinmitz observes (p. 30): As every wind with west in it is more or less connected with that which comes to us laden with moisture from the Atlantic, it will not be surprising to know that westerly winds have the greatest influence on the degree of humidity in the air. Now, England is certainly a moist country, and that results from the fact that our southerly and westerly winds are to our northerly and easterly winds as 196.4 is to 135.0. In a mean of years we have the following winds:

North	40.7 days.
North-east	47.6 ,,
East	22.6 ,,
South-east	19.9 ,,
South	34.2 ,,
South-west	104.0 ,,
West	38.3 ,,
North-west	24.1 ,,

If, however, the efforts of the husbandman in deepening and pulverising his soil tend to the increasing their supply of atmospheric moisture, his labours in another direction sometimes diminish it. "It is evident," says Dove, "that a vigorous vegetation produces rain, which, on the other hand, nourishes again that vegetation, and that the senseless destruction of forests very often has destroyed the fertility of the soil. Previous to 1821, Provence and the departement du Var possessed a superfluity of brooks and springs. In that year, the olive trees, which formed almost forests, were killed by frost, and they were cut down to the root in 1822; since which time the springs dried up, and agriculture suffered. In Upper Egypt, the rains, eighty years ago still abundant, have ceased since the Arabs cut down the trees along the Valley of the Nile towards Libya and Arabia. A contrary effect has been produced in Lower Egypt, through the extensive plantation of trees by the Pasha. In Alexandria and Cairo, where rain was formerly a great rarity, it has since that period become much more frequent."

"The proportion of forest or woodland required for an agricultural country, in order to ensure a regular and sufficient rainfall without violent storms, has been estimated," observes Mr. Steinmitz, "at 23 per cent. for the interior, and 20 per cent. near the coast. This estimate by Rentzsch related to Germany; but in England the proportion, according to the same authority, is only 5 per cent., and even this is reduced by Sir Henry James, the head of the Ordnance Survey department, to 2½ per cent.

This is certainly a very small proportion, and below that of every other country, the next lowest being Portugal, which has very little woodland."

The influence of trees in adding to and preserving the water of springs and ponds is well known. In some parts of England they are careful to have the oak planted around their ponds; and, bearing upon this fact, I may mention that the dew under some large oak trees by the side of my bowling-green, at Croydon, is always considerable of an evening; but that under a wych-elm growing by their side the dew is almost always absent. The advantage of planting trees around ponds has been well alluded to by Mr. R. Orlebar, of Wellingborough (*Jour. Roy. Ag. Soc.*, *N.S.*, vol. ii., p. 110), although he appears to lay too entirely a stress upon the *shade* (and consequent retardation of evaporation) they afford to the water. He observes: "It is astonishing what an effect a little shade has in checking evaporation. A pond that is well shaded will hold water for weeks after one of equal dimensions, but lacking shade, has become dry. Yet how recklessly have I seen men cutting up every bush and tree round the banks of their ponds! True, a few leaves may drop into the water; but if the pond-owner will only take the trouble to observe the marvellous tenacity of a thoroughly-saturated leaf, he will, I am sure, be soon convinced that many an autumn must pass away ere the accumulation of leaves which may drop into his pond can do him any arm. Always therefore, if possible, have the mouth of your pond on the north side, and shade on the south. The best shade is that given by fir trees, for they give it all the year round. Moreover, a less quantity of leaf falls from them than from other trees, and that which does fall, being specifically heavy, falls straight, and is not likely to be blown by the wind when fallen. Neither are the branches of fir trees as liable as others to die and fall off, unless they are allowed to grow too thick together. It is a maxim among those who cultivate the fir for its beauty, that no tree of this sort should ever touch its neighbour. At the same time, in exposed situations, they must not be planted in too narrow a belt, or the wind will blow through and stunt them all. It may be as well, too, to remark that the Scotch fir, from its more hardy habit, is infinitely better adapted for exposure than its more delicate congener, the spruce. The yew would, perhaps, be even better for shade than the fir, but for its poisonous qualities. After the fir, I doubt whether there is, on the whole, any better plant for shade than the hawthorn bush. Its leaves sprout early, and fall late; and it possesses, besides, the great advantage that it forms its own fence."

An instance is given by Mr. Steinmitz, on the authority of Boussingault, of the influence of a plantation of fir trees upon the water of a spring: "A few years ago the Wolf Spring, in the Commune of Soubey, did not exist. At the place where it now rises, a small thread of water was observed after very long rains; but the stream disappeared with the rain. The spot is in the middle of a very steep pasture inclining to the south. Eighty years ago the owner of the land perceiving that some firs were shooting up in the upper part of it, determined to let them grow, and they soon formed a flourishing grove. As soon as they were well grown, a fine spring appeared in place of the occasional rill, furnishing abundant water in the longest drought. For 40 or 50 years this spring was considered the best in Clos de Doubs. A few years since the grove was felled, and the ground turned again to a pasture. The spring disappeared with the wood, and is now as dry as it was ninety years since."

The interesting but somewhat differing way in which the leaves of plants appear to act in the receiving and disposal of dew was noticed by Mr. J. Parkes (*Jour. R.A.S.*, vol, v., p. 133). "A blade of grass," he observes, "is sometimes spangled over with dew-drops, but it usually becomes wetted throughout its whole surface by the running together of the drops, and thus conducts the water to the earth in minute streamlets; whereas the leaves of the clover, cabbage, nasturtium, and many other plants will be found to collect it in distinct globules, which may be rolled about on the leaf without appearing to moisten it. These drops, in fact, do not touch the leaf, but rest and roll upon a pillar of air interposed between them and the substance of the leaf. On very translucent nights I have seen the tender clover-leaf bend beneath the weight of its crystal load, discharge it on the ground, and immediately begin to accumulate another globule. Cup-formed and horizontal leaves and flowers seem to retain all, or nearly all, their collected dew for their special use, as if it were more beneficial to them when so applied than to their roots." The *repulsion* of water by the leaves of certain plants, and by the feathers of water-fowl, has been also investigated by Dr. C. Buist (*Proc. Roy. Soc.*, 1857, p. 520). In some experiments carried on at Bombay, with four varieties of lilies and the lotus, he found that from the upper surface of the lily leaf the water runs off without wetting it, as it does off a piece of glass or greased surface. From the lotus leaves it flows off like a pool of quicksilver, reflecting light from the whole of its lower surface. The repellent power is on the upper side of the leaf only. "On examining," remarks Dr. Buist, "into the cause of this, I found the lotus leaf covered with short microscopic papillæ, which entangle the air and establish an air-plate over the whole surface, with which in reality the water never comes in contact at all. Another peculiarity connected with this, was the singular respiratory pores of the lotus. The leaves of the lotus, when full-sized, are from a foot to 16 inches in diameter; on cutting off a leaf 6 inches broad, the stalk of which was less than the third of an inch in diameter, I was able to collect 33 cubic inches of air in an hour, when the vital energies of the plant must have been injured by its mutilation. At this rate a tank covered with lotus leaves would produce daily an atmosphere 4 feet in depth throughout its whole surface. When the leaf is pushed slightly under water, a constant succession of air-bubbles seem to arise from it, at the rate of two or three a minute at each spiracle. The air-bubble diffuses itself as it is extricated, presenting a very broad base to the leaf and blunt low-crowned apex, and seems detatched with difficulty. The air-plate all over the surface must thus become continually renewed, and the arrangement kept perfect. Sensible respiration is not at all essential to the repelling power of leaves; the most beautiful manifestation of it I have met with is in the Pestia, a little floating water-plant abounding in our shallow tanks, and resembling common endive. When pushed under the surface it looks like a little mass of burning silver. The same appearance is presented on cabbages, young clover, and a vast variety of other leaves; it is the cause of the bright pearl-lustre of dew. The same phenomenon is manifested on the wings and backs of divers when they dash into the water. In this case it has been ascribed, most erroneously as I believe, to the presence of grease or oil in the feathers, and is, I have no doubt, due to the presence of an air-plate repelling the water, so that it never comes in contact with the feathers at all. The trimming process, so carefully performed by water-fowl, is probably an application of oil or grease, with the object of separating or dressing the little fibres of the feathers, so as to produce an arrangement fitted to entangle the air. The reflection of light from the lower surface of the water is the proof of want of contact. A piece of polished marble or of glass, a waxed, oiled, or greased surface, readily throws off the water without remaining wetted; but no reflection is in this case observable"

Such are the kind of interesting objects—such the phenomena which mark the finger of a Divine Architect—the love and care for the welfare of his creatures—even in the sparkling bubbles gliding from the leaf, down to the root of a plant, or off the wing of a bird, so marvellously formed that it floats in water, or rises through the falling shower equally unwetted! These investigations, too, we must perceive, are fraught with practical value; for they serve as teachers, that tend to increase the produce of our soils, and to the welfare of our domestic animals.

MANGEL-WURTZEL CULTURE.

I have so often written upon this subject as to cause me some uneasiness, if not an apology for again presuming to pen another paper upon it. As years, however, roll on, slight improvements enter into its culture and management, which I desire to touch on. This root-crop has had to battle with the prejudices of British farmers for more than fifty years. It has, I believe, now fairly conquered every opposition to its progress, and its popularity has become universal and so great, that it is in very many districts pronounced to be the best and most valuable of our root-crops. Such being the case, it is highly desirable that every favourable course connected with its profitable growth should be before the public. One of the most prominent and pleasing features connected with its culture is the great improvements which have been achieved in the various stocks or varieties offered for public favour. If long experience of its character, growth, and management is of worth, I may claim some consideration. I was a rather extensive grower (for the time) of "beet-root" (*i. e.* mangel wurtzel), about forty-six years ago, having at that time from twelve to fifteen acres under management. At that period we neither knew aught of its correct culture, its proper uses, or the character of the stock or variety sown. All this has gradually opened before us. The original stocks were so bad, so small, "rooty," "stringy," "fangy," and the mismanagement in housing, harvesting, and administering to stock so great that it grew into disfavour, and for a time a lesser breadth was grown. Subsequently, but slowly, its real value became developed; choice roots were selected for the propagation of seed; new sorts were raised, and introduced. Originally a bad kind of long "red beet" was all we could get. These in the course of a few years were, by careful selection, crossing, and attention, wonderfully improved; our crops exceeded by from ten to fifteen tons per acre those previously grown, and were produced also with less detriment or drawing of the land, and the roots of far better quality. Soon the red and the yellow globe mangels were brought into notice, followed by the long yellow. These discoveries have caused great advancement in the culture, inasmuch as a variety can now be adapted to almost every soil and climate in the United Kingdom. Indeed, we are now happily situated, and so favourably supplied, that a bad sort is scarcely to be found. Our seedsmen vie with each other in the production of superlative stocks, and the varieties are so good, the roots so fine and heavy, that it is almost immaterial from whom or from whence seed may be procured for sowing. The principal care should be to select a variety to suit the nature of the soil and condition of the land, as to fertility. A rich loamy soil should rather be planted with the best long reds, or long yellows; but capital crops of yellow globes are grown thereon; in fact, such soils are adapted for any good variety. The difficulty is to select a kind to suit a poor soil to advantage. If the soil is thin, but of open texture, I should prefer the yellow globe. I say "yellow," because I have never seen a red variety of equal value with our best yellows: long sorts do not do so well on thin soils. On stiff soils, worked up to a good tilth, any variety will do well; but I think the globes are most suitable, as from their habit of growth they do not send down their roots like the long sorts. I think, however, the long sorts have a slight advantage in their productive qualities. They strike deeper for food, and obtain thereby an increase of weight, but they do not retain their quality like the globes, when kept for spring service. Much is said about the exhaustive character of this crop on the majority of soils. There is common sense in this remark; but if the proper manures are used, and plenty of it, and the crop is fed upon the farm, it becomes mainly a question of cartage as respects the expenses. The return of the manure made by the consumption of this crop in the fold-yard, or it may be in part upon the field where grown, will fully compensate. There cannot be much deterioration of the farm, so long as this crop is fed upon it. Potatoes, on the contrary, are sold off; and yet such is the attention and liberal management bestowed upon this crop, that I venture to assert that, wherever it is extensively grown, the farm has been improved by it. I name this to show that modern ideas of artificial aids can and does in practice overcome all these objections to heavy cropping. It is impossible to continue a course of heavy cropping without adopting such a course. This is one of the "slight improvements" in the culture of mangolds—a further judicious outlay in artificial aids.

The practice now becoming general is—first, the adoption of the ridge system; next, to give a liberal application of fold-yard dung between the ridges; then to follow by a dressing of superphosphate, or guano or blood manure, or other similar manures, or a mixture of two or more of them, which is most approved. This dressing of from 3 cwt. to 4½ cwt. per acre to be sown along the ridge upon the fold-yard dung; then ploughed in, and a further dressing of superphosphate, or the like, at the rate of 2½ cwt. per acre, mixed with ashes or decomposed vegetable matter, night-soil, &c., &c., to be drilled in with the seed. In this way surprising crops are produced—almost to exceed belief as an ordinary farm crop in common rotation or course. Another practice is somewhat popular, and is gaining ground. It is to sow about 10 cwt. of salt per acre between the ridges upon the fold-yard dung as above. This has likewise been productive of extraordinary crops. Soot is also now added to the salt in many cases, with great success.

The crops I allude to may not be astonishing to market gardeners or amateurs; but when in ordinary farm practice thousands of farmers can produce by applications and such management as I name from thirty-five to fifty tons per acre of these valuable roots, I say it is surprising; and more, it is a more profitable crop than a crop of corn at average prices. It is true tenant-farmers must consume the crop on the farm, which materially lessens its value; but consider the weight of food to be eaten, what a large amount of cattle, sheep, &c., &c., can be thus provided for and supported, what beef and mutton is yielded per acre, what excellent fold-yard dung is made. These courses may be considered expensive, and so they are; but what of that? It is but seldom a failure occurs, and failures do occur in all trades and speculations, It is one of the safest of all outlays of capital. It is simply putting more capital into the farmer's business, for which he will upon the average be abundantly repaid. Mind, it must be judiciously carried out. No pains must be spared to produce the crop, and every care and judgment put in exercise to manage it throughout, so as to make it profitable. One little item in attention to its growth I will name. If the weather is warm and dry, it is good practice to go over the crop ridge by ridge, and apply salt to every sickly plant. I say nothing in this paper relative to its harvesting or consumption. The only thing I wish further to moot is this: I think the whole farming community should endeavour to prevail upon the landlords to permit its sale from the farm, and to induce railway companies to carry this heavy produce upon the same tonnage rates as coals, gravel, stones, &c., &c. This would speedily produce a general demand in every populous town, and form a new department in the farmer's business. Cow-keepers, horse-keepers, and pork-feeders would only be too happy to become purchasers.

P. F.

SHEEP-GRAZING IN A WET SEASON.

I do not presume to direct or guide my brother-farmers in the treatment of their sheep in this wet and prolific season (for seldom have we known the grass to grow faster or become so coarse and rank in so short a time), but to call their immediate attention to the state of their flocks. Monday, the 6th of May, was one of the most forcing days ever known. It was followed by three or four days of similar character; but on Saturday a great and sudden change took place, with much rain. On Sunday and Monday much cold rain and some hail fell. These sudden and violent changes having caused the grass to become very cold, succulent, and therefore in a great measure indigestible, and the lairage being wet, scouring has, in consequence, become general throughout the flocks. Suckling lambs and weak hoggets are more particularly affected, but ewes and fatting sheep do not escape; indeed, if not speedily checked either by change of weather or treatment, not only diarrhœa, but dysentery will soon be universal, and very probably to be succeeded by sheep-rot. Now, this is alarming, and every attention and remedy should be resorted to at once, with the view to stem the danger. It is several years since we had a wet summer, and, almost as a matter of course, farmers are unprepared to contend with it. The subsoil-drains on the grass lands have not had the requisite attention, and the grass is thus further injured by excessive moisture, besides making the lairage cold and damp at the very seed-time of sheep-rot, when followed by warm weather —*i. e.*, wet grass-pastures and forcing seasons are the true precursors of sheep-rot. At present nothing is apparent but common scouring—diarrhœa. If this can be stopped in any reasonable time, no further danger is likely to occur; but should dysentery succeed, then very severe losses will be experienced. There is little or no danger of infection from diarrhœa; but when it assumes the character of decided dysentery, then it is not only highly infectious, but very fatal. Diarrhœa frequently degenerates into dysentery. This may be chiefly known from the extreme offensiveness of the excretions. The sheep, when thus dangerously affected, should be immediately removed from his fellows to prevent infection, and be treated medicinally, or he will soon die. Bleeding, physic, astringent cordials, &c., then mashes, gruel, hay, and other dry food, should be judiciously administered, and followed up regularly. But "prevention is far better than cure." How can this be done? In a season like the present it is extremely difficult, if not impossible. However, every care and attention should be given, and every precaution taken.

I will, notwithstanding the cavils they may call forth, venture to give a few hints or suggestions. It is absolute folly in such a season to put weak hoggets or any sheep in low condition upon strong land, or rank, full, highly succulent pasturage—particularly with cold and wet lairage. The poorest land and shortest pasture should be theirs, and they should have rations of cotton-cake and dry chaff twice daily; and, if scouring continues, a few hours daily in the fold-yard, with hay and straw *ad libitum*, will be very conducive to their restoration. The suckling ewes should be thickly stocked upon their pastures to keep them, if possible, within proper limits. Rations of cotton-cake and chaff should be given, and hay or straw should be supplied at their option: many will help themselves occasionally. The lambs should have a separate compartment fenced off, to which they alone can have access; and malt-comb meal, corn, or bran, and chaff, should be at their disposal at all times in convenient troughs. They will soon learn to supply themselves with the good things thus provided. The ordinary grazing hoggets should receive the like treatment with the suckling ewes; but to keep the pastures in proper grazing order a good supply of grazing cattle should be placed along with the sheep. These will keep down the rough herbage, so that the fields may graze profitably without loss of any portion of grass, and the sheep will be greatly benefited by having such a continuation of the very grasses most conducive to their progress; for, according to the old adage, "The grass should be twelve days old for the ox, but three days old for the sheep."

There are many nostrums and drinks, which are highly recommended by practitioners as almost certain specifics or sure remedies against these inroads of stock progress. These should be resorted to with great caution; bleeding will aid much in subduing fever; purgatives will aid thus, but they will also carry off impurities and injurious lodgments in the intestines; astringents and diuretics will also give great relief in attacks of diarrhœa and dysentery. Care should be taken then, in the administration of these remedies, lest hurt instead of good be done. Simple medicines and simple applications are generally best. These drinks should not be given unless their precise nature is known. In most confirmed cases of diarrhœa bleeding should be the first resort, pricking both nostrils will generally be a sufficient bleeding, next a slight purgative dose should be given, say a table-spoonful of Glauber or Epsom salts, and a nip of ginger, to be repeated two or three times as judgment dictates; this is the simplest purgative in common use. If the excrement becomes more healthy in appearance, then follow up with diuretic drinks, once or twice repeated. In very obstinate cases laudanum may be freely used; strong wheat-flour gruel is a very good preventive, and will often stop scouring. I am not, however, conversant with the best modes of treatment for diseased sheep; my chief remedies lie in change of food and change of pasture, but medicinal remedies are not to be despised. There may be much trouble in administration to large flocks, but anything is better than their destruction. I trust that before this paper is in print the danger may be averted by a return of genial weather; if so, much precaution is then necessary. Sheep cannot pass from a very laxative state of body to dry herbage and hot weather without danger. Inflammatory action may then be feared: constipation is almost sure to take place. To prevent these dangers, linseed-cake, bran, and common salt should be given them, the salt in a vessel so as to be always accessible. Water, if possible, should be regulated for them. Sickly animals take far too much. In fevers they are always longing for it. It should be supplied in moderation. Should sheep-rot ultimately follow, the prospect is extremely bad. The principal and most favourable thing in prevention of sheep-rot is the universal practice of subsoil drainage. This practice has nearly done away with the disease. We seldom hear of a case. The aim of every flockmaster should therefore be to clear his pastures of superfluous water and excessive moisture, in every practicable way, as fast as possible; but if he cannot do this, to remove his flock for awhile from them—*i.e.*, put them upon seeds thickly, upon fallow grounds to pick stray grasses, or to weed beans—anywhere, if they can only be removed for a short season, in prospect and in hope of a favourable change. A supply of dry food, as corn, bran, chaff, cake, &c., will prevent their retrograding to any extent. If the weather becomes dry and cool, the pastures will in a great measure recover their healthy herbage; but if warm and moist, it is very detrimental, and the worst fears of rot may be entertained. Generally speaking, the pasturage most likely to produce rot is that grown in swampy hollows, or the furrows and lowest places in the fields. The real cause of rot in sheep is, I believe, unknown; but it is known that these low swampy places in fields conduce to produce it, and therefore the great thing would be to improve them in the best way possible. It would be highly beneficial to plough up such swampy places occasionally, and resow them with proper grasses for moist situations. Medicinal remedies are recommended in profusion, but I never heard of much good from them. The best course, undoubtedly, is to slaughter them, particularly if in suitable condition. In the first stage of the disease sheep will actually improve for a short time, and this is the time to slaughter. Shepherds accustomed to sheep-rot can frequently detect the attack by symptoms from the eye and general state; but to no certainty. The gradual loss of flesh and languor is more decisive, and may be acted upon. It is a disease, in its direful attacks, synonymous with cattle-plague. I trust we shall be preserved from it; but let every effort and care be taken to avert it.

LANDLORD, TENANT, AND FIELD SPORTS.

At the Norfolk Hunt Dinner, Lord LEICESTER said there was no man in that room more satisfied than he was of the beneficial effects attending the existence of a pack of foxhounds in the country. It was possible they might not have the same good hunting district as in other parts of the country: strangers did not join them, as in some favoured counties, and perhaps they did not derive that pecuniary advantage from the sale of their horses as elsewhere. But they had what was, in his opinion, of more importance—the same opportunity of class meeting class, and landlord meeting tenant, the same opportunity of an interchange of good fellowship. Mr. De Grey had kindly alluded to his (Lord Leicester's) woods having foxes in them. While he considered that he and many other landlords of this county were mainly indebted for the principal part of their sport—their partridge shooting—to those who did hunt but who did not shoot, he thought it would not only be a great want of policy on the landlords' part, but great ingratitude if they did not endeavour, as far as lay in their power, to make some return. This love of sport he believed to be innate in Englishmen. There were few salmon rivers in the world where Englishmen did not fish. There were fox-hounds at Rome, and there were fox-hounds at Gibraltar; in fact there were but few portions of the known world where Englishmen were not at that present moment pursuing the wild animals that inhabited them. This pursuit of sport ought not to be their sole object in life; but he held that the courage, the endurance, and the patience that were requisite to ensure success in the field, not only strengthened the body but enlarged the mind, and fitted a man for higher duties. It was this, and the love of out-door amusements, which was one of the main reasons why the English race had so pre-eminently distinguished themselves in endeavouring to colonise the world. This courage and endurance was more particularly displayed by those who led our troops up the slope of the Alma, and into the battle of Inkermann. Those men had not passed their leisure hours in the billiard-room. There were few of them who had not tried their energies in various parts of the world; few of them, he believed who had not hunted with packs of hounds; and those among the private soldiers who were most distinguished for their good conduct and gallantry were—and he spoke it as a fact—often members of the regimental cricket eleven, or men who had otherwise excelled at football or some other sport. He need hardly allude to the spirited race which had lately taken place on the Thames: such a race, and such an exhibition of courage and endurance, he had no hesitation in saying could not have taken place in any other part of the world. He thought he had stated sufficient reasons for the encouragement of all legitimate sport; but those were not what he considered the principal reasons why they should support the fox-hounds in the country. It was that the opportunity was afforded of man meeting man, and of that interchange of courtesy which too rarely occurred even amongst those who were generally resident in this county. In the Chamber of Agricultue, which had lately been introduced into this county, an opportunity was now afforded for man meeting man, and for some interchange of ideas. If he were not so far from Norwich, there were few of those meetings he would not have pleasure in attending. There the landlord would find the tenant-farmer ready to discuss all matters in which they were equally interested in a fair and liberal spirit; and there, he trusted, the tenant-farmer would find the landlord not so wedded to those class interests as the world gave him credit for. He believed that if grievances were well ventilated, in many cases they were grievances no longer; and even that perplexed question of game, if fairly discussed, would, he believed, be amicably settled—in the only way, in his opinion, in which it could be settled. If the landlord would give the tenant a fair right of coursing on his farm; if he would give him permission to kill rabbits whenever he could find them; and should he let his shooting, he ought not to let his ground game with it; and, perhaps, he ought to add, let the landlord be a preserver of foxes; if he would make these concessions, he was confident that his sport would not diminish, but that his happiness would increase. And, above all, let each of them endeavour in the pursuit of their amusements, as well as in their business, to follow out the good old maxim of doing unto others as you would they should do unto you, and he should have a thorough confidence that the Norfolk fox-hounds would rarely meet with a blank day, and that the murmurings about game would be a thing of the past.

Sir WILLOUGHBY JONES said the over-preservation of game was the bane of fox-hunting in Norfolk. If they had no rabbits in West Norfolk, they could show twice the sport. Rabbits poisoned the ground; and not only that, although the earth might be stopped in every direction, if the place were honey-combed, and there were so many holes large enough for a fox, how could they ensure that foxes would not get into them? If they could get thoroughly rid of rabbits in West Norfolk, he had no hesitation in saying that an amount of sport would be shown that would not disgrace the much-belauded Shires.

THE ANNUAL MEETING OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The annual meeting of the members of this society took place on Wednesday, May 22, in Hanover-square. Owing to its being the Derby-day, the attendance was much smaller than usual. As was subsequently explained, the Charter requires that the annual meeting shall be held on the 22nd of May, unless that day happen to fall on a Sunday, in which case it must be held on the 23rd.

The chair was taken at noon by the President of the year, Mr. Thompson; and among those present were Lord Walsingham, Sir Henry Vavasour, Sir Walter Stirling, Sir Massey Lopes, M.P., Col. Towneley, Mr. Edward Johnstone, Mr. Dent, M.P., Mr. J. C. Morton, Mr. Astbury, Mr. Rolton, Mr. Symes, and Dr. Crisp.

The vacancies in the Council having been filled up by the adoption of the House-list, with the names of the Honourable H. G. Liddell, M.P., and Mr. N. C. Stone, as new members of Council.

Lord Walsingham said he had to propose a president for the ensuing year; and he was sure every one would be glad to hear that the nobleman whom he had to nominate had agreed to accept the office. Those who knew the late Duke of Richmond, and the attention which he paid to all agricultural matters and to the business of that Society and others of a kindred nature, must be delighted to find that the present Duke was following the example of his father, and was willing to act as President during the ensuing year.

Sir Massey Lopes, M.P., in seconding the resolution, observed that no family had taken more interest in all that pertained to the welfare of agriculture than the family of Richmond; and he was quite sure the proposed appointment would meet with the approval of every member of the Society.

The motion was then adopted.

On the motion of Mr. Dent, M.P., seconded by Mr. E. Johnstone, M.P., who remarked that it was a singular thing that that meeting was suffering, as regarded the attendance, from the same cause from which farmers suffered so much in their expenses—namely, horseflesh—the trustees were re-elected.

On the motion of Sir Massey Lopes, seconded by Mr. E. Johnstone, the vice-presidents were also re-elected.

The Secretary, Mr. Hall Dare, then read the following Report of the Council:

"The Council have to report that since last December the Society has lost by deaths and resignations 226 governors and members, while five governors and 173 members have during the same period been enrolled on its list, which is now constituted as follows: 77 life governors, 82 annual governors, 1,388 life members, 3,903 annual members, 15 honorary members, making a total of 5,465.

"The Council have elected the Right Hon. Lord Tredegar and the Right Hon. Lord Chesham to be trustees, in the room of the late Sir John Shelley, Bart., and the late Lord Feversham; the Right Hon. Earl Cathcart a vice-president, in the room of the late Marquis of Exeter, K.G.; his Grace the Duke of Devonshire, the Right Hon. Sir John Trollope, Bart., M.P., Mr. William Hassell, of Bubney, Whitchurch, Salop, and Mr. James Webb, of Springhill, Fladbury, Pershore, Worcestershire, to be members of Council, in the room of Lord Tredegar and Lord Chesham, elected trustees, and Sir Edward Kerrison, Bart., and Earl Cathcart, elected vice-presidents.

"The Bury St. Edmunds meeting, to be held in the week commencing Monday, the 15th of July, postponed from 1866 in consequence of the prevalence of the cattle-plague, promises to be unusually large in the display of implements. The entries of horses, sheep, pigs, and poultry will remain open, as usual, till the 1st of June; but, the Privy Council having decided not to allow any exhibitions of store stock to take place during the ensuing summer, the Council have been compelled to withdraw that portion of the prize-sheet relating to cattle. The Society have, therefore, increased the amount offered in prizes for horses £300, which, with £50 added by the local committee, makes the total amount for horse prizes £1,565.

"The Council have decided, subject to the usual conditions, to hold their country meeting next year at Leicester.

"Lectures have been delivered before the Members by Professor Simonds, on Diseases in Sheep; and by Professor Voelcker on the Relative Value of different kinds of Purchased Food, with especial reference to their Manurial Properties; and a discussion has taken place on the Reclamation of Land from the Sea, and the Formation of Tidal and other Banks.

"The improvement of the education of the agricultural classes has been the subject of much consideration by the Council, and they have voted £300 for the promotion of that object during the ensuing year, subject to the following conditions:

> The Candidates for the Society's honours and prizes must be between the ages of 18 and 25 years, and must produce satisfactory certificates that they have received a good general education. They must also satisfy examiners appointed by the Council that they possess a competent knowledge of the Sciences and Practice of Agriculture, of Book-keeping, and of one or more of the following subjects:
>
> 1. Agricultural Chemistry.
> 2. Mechanics in their application to Agriculture.
> 3. Surveying; Veterinary Science, Geology, and Botany.

"The Council invite special attention to the number of the Journal lately issued. It will be in the recollection of the members of the Society that soon after the decision was made not to hold a Country Meeting last summer, the Council resolved to vote the requisite funds for a special inquiry into the results of Steam Cultivation in England and Wales. The Committee appointed to conduct this inquiry have lately reported that they have concluded their labours, and that, notwithstanding the very unfavourable character of the summer and autumn of 1866, they are satisfied that the work has been well and thoroughly done. They state that the reports of the Committees of Inspection occupy 330 pages of the Journal and have been prepared at a cost of £180. Independently of this amount, which may properly be classed among the Journal expenses, the whole cost of the inquiry has been £692. The wideness of the area over which this investigation has extended, and the magnitude of the interests involved, give to these reports an almost national character, and the numerous lessons to be derived from their careful perusal, both in the way of encouragement and of warning, will be fully appreciated not only by those engaged in steam cultivation, but by that much more numerous body who are anxiously endeavouring to satisfy themselves whether or no they may safely take a part in this latest and most powerful development of the resources of British Agriculture.

"By order of the Council,
"H. Hall Dare, *Secretary*."

Lord Walsingham moved the adoption of the Report.

Mr. J. C. Morton, in seconding the motion, expressed special satisfaction with that portion of it which relates to agricultural education.

Mr. Dent, M.P., said he wished, before the Report was adopted, to say a few words on a subject which, though it was not exactly embraced in the Report, was of very great importance at the present time; he referred to the large number of cases of cattle plague which had recently occurred in the Metropolis. He considered that a very serious matter, and he feared that the attention of the Government had not been sufficiently directed to it. During the last three weeks the disease had broken out at seven or eight places in the Metropolis with as much violence as it manifested two years ago. They all knew that it was from the Metropolis that the disease spread through the country, inflicting such loss not only on British agriculturists but also on consumers; and he felt sure that if the dairies were again devastated as they were two years ago, milk would soon be at a famine price in London. From the answers given in Parliament to questions as to what course the Government intended to pursue with regard to the bringing of foreign cattle to the Metropolitan Market, he feared that they did not know exactly what to do. He had no wish to criticise the Privy Council office, but he must say that he thought there were marks of doubt and indecision which might lead to great danger, and he hoped that remonstrances would be made either by the Council of that society or by farmers generally against foreign cattle being allowed to be brought as they were to the Metropolitan Market. He believed the disease was at present raging in many parts of England, and he could not imagine that anything like proper supervision was exercised to prevent its being brought again to London (Hear, hear). On the previous night a Bill was introduced into the House of Lords the provisions of which he could only infer from the speech of the noble Duke (the Duke of Marlborough) in bringing it forward, and he hoped the result would be that some stringent regulations would be established. Last year, when sitting on the Committee of the House of Commons on trade in animals, he scarcely thought it would be desirable to render imperative the slaughter of foreign cattle at the port of embarkation; but he owned that his feelings had since then changed, and he now thought that in order to prevent this country from being again visited with the plague Parliament would be compelled to resort to that regulation. The recommendation of that committee was that there should be a department of the Privy Council office specially devoted to agriculture; that that department should obtain information from English officials abroad, so that it would know when the disease existed in any particular country; and that when its existence was ascertained the Privy Council should entirely prohibit the importation of cattle from that part of Europe. If all this were done, no doubt greater liberty might be safely allowed for the movement of foreign cattle in England; but he was inclined to think that until it was done it was essential to the health of our own cattle that foreign cattle should be slaughtered at the port of embarkation. The disease having broken out afresh in several London dairies, they must all feel that the matter was a very serious one, and he hoped something would be done to ensure the adoption of stringent measures.

Mr. SYMES would like to know whether the animals attacked in the dairies had come in contact with foreign cattle?

Mr. DENT replied that it had been stated in the newspapers that some Austrian cattle had been placed in a lair near one of the dairies; adding that the researches of last year clearly showed that the disease was imported from abroad, and that as late only as the previous Monday there was a serious outbreak in one of the London dairies.

Mr. SYMES thought it very desirable that care should be taken lest any measures of restriction that might be adopted with regard to foreign cattle should injure the British farmer almost as much as the cattle plague itself.

Sir M. LOPES said he felt very strongly on this subject. He had long thought that foreign cattle ought to be slaughtered at the port of embarkation. Living as he did near a large port (Plymouth), he believed that on all occasions when the plague was introduced there it was through the importation of foreign cattle. The good effect of taking proper precautions was very marked in the neighbourhood. Plymouth was a place where large contracts were taken for the army and navy, and where consequently great anxiety was felt with regard to the health of animals; but not only was there no cattle-plague during the continuance of the restrictive measures which were carried out last year, but no pleuro-pneumonia, and no foot-and-mouth disease. He had no wish to propose a motion on the subject, but he thought it very desirable that the Council of that society should urge the Government to take more stringent measures than they seemed inclined to do at present, judging from what passed in the House of Lords on the previous evening. His own opinion was that no cattle should be allowed to leave foreign ports alive, but that all should be slaughtered there until there had been no plague in this country for one year.

Lord WALSINGHAM said the bill just introduced into the House of Lords was to be referred to a Select Committee, and the Council and all who felt interested in the matter would have an opportunity of placing recommendations or suggestions before the committee. He was inclined to the opinion of Mr. Dent as regarded the slaughtering of foreign cattle.

Dr. CRISP believed that there would be no difficulty whatever in slaughtering foreign cattle at the port of landing. When this disease first appeared in this country he publicly stated it as his opinion that it would never be got rid of unless that course were adopted, and the result supported that view. The recent outbreak in London was a very serious matter indeed, and he still believed that the only remedy was to provide that fat animals should be slaughtered at the port, and store cattle left in quarantine.

Sir H. VAVASOUR said it appeared to him that the disease might be prevented quite as much through the Foreign-office as through the Home-office; for instance, by employing our consuls. He would suggest whether it would not be practicable to enter into some treaty with such countries as Russia, Belgium, Holland, and France, which would prevent diseased cattle from being exported to this country as well as to others. When once the cattle plague had come to England it seemed almost impossible to prevent it from spreading.

Sir WALTER STIRLING quite agreed with the last speaker, that there was great danger of the cattle plague again spreading from the metropolis over the whole country; and, considering that that was the centre of agriculture, he was surprised that the interest attached to that subject and others had not attracted a larger attendance. There were many questions of vast moment calling for consideration, and among them was the continued establishment of Chambers of Agriculture; and the fact of the annual meeting being so thinly attended might almost lead any one to suppose that the Royal Agricultural Society was almost an effete body, which having done its work had devolved its functions upon others (a laugh). What had just taken place in the House of Lords illustrated, in conjunction with other things, the prescience and ability of their excellent chairman, as shown in the admirable address now published in the *Journal* for the perusal of agriculturists —an address in which it was pointed out that there was no remedy for the disease except stamping out; and he should have been glad to see a larger attendance of members if only that the services of the President might receive a proper acknowledgement. He concluded by alluding in terms of regret to the deaths of Lord Feversham and Sir John Shelley, whose memories deserved to be honoured on account of the services which they had rendered to agriculture.

The CHAIRMAN said the smallness of the attendance was no doubt owing in a great degree to the holding of the meeting on the Derby Day; but that was unavoidable, in consequence of the annual meeting being fixed for the 22nd of May by the Charter. He hoped that, as special invitations had been sent out for the discussion of the question of steam cultivation on the following meeting, there would be a large attendance on the occasion. With regard to what had fallen from Sir M. Lopes and others respecting the importation of foreign cattle, he might mention that he had already had some conversation on this subject with the Lord President of the Council (the Duke of Marlborough) both with reference to the Show at Bury, and the provisions of the Government Bill; and his Grace expressed a strong wish that the Council of that Society would especially consider that Bill, and appoint a deputation afterwards to confer with the Privy Council, and suggest alterations or omissions. The question raised by Mr. Dent might very properly form a portion of the inquiry before the Committee. He (the Chairman) entertained a very strong feeling on that subject. Some months ago he did not think it would be necessary to have cattle slaughtered at the ports of disembarkation; but he thought that a system of quarantine might be established which would meet the case. However, since then there had been several cases in which the plague had shown itself in this country; and it was the opinion of those who lived near the spot, and were most likely to form a sound judgment on the matter, that the evil arose from the illicit importation of foreign cattle, and the spreading of the disease from the port of landing. Sir Martin Lopes had mentioned Plymouth. They all knew what had happened in London; and in his (the Chairman's) own part of the country, there was an exceedingly strong opinion that the outbreak at Holderness was due in a great measure to foreign cattle brought to Hull. He could not give any decided proof that that was the case; but he did know that in the importation of cattle at Hull there was an entire disregard of the orders and regulations on the subject. Under these circumstances, he thought that so long as the cattle plague was raging on the Continent of Europe in countries from which cattle were imported to England, foreign cattle should be slaughtered at the port; but that power should be given to the Privy Council in the Bill before Parliament to sanction the discontinuance of such slaughtering as soon as the danger had really passed away; after which, he thought, a good system of quarantine would be sufficient for the purpose. With regard to the question of holding a cattle show at Bury, he should like to read two letters which were intended for publication, and had not yet been published. The Council had naturally wished that cattle should be allowed to be exhibited at the Bury meeting; but before coming to a formal decision to appoint a deputation to the Privy Council, they wished to know whether there was any sufficient reason to prevent the Council of the Royal Agricultural Society from making such an application, as, if the Privy Council had information of such a character as to make them think it dangerous to give permission, the Council of that Society would not like, apparently, to throw its weight into the scale, in opposition to what prudence seemed to require. That being the case, he (the Chairman) had an interview with the authorities of the Privy Council, at which the question was fully considered; and it was decided that it would not be right to allow the cattle show to be held. He reported that decision, with the reasons, to the Council of this Society, who determined not to appoint a deputation or take any other measures to press the point. The reasons which influenced the Privy Council had been put on paper, with a view to publication. He might say that, since then, there had been further cases of cattle-plague. When the Council made their original application, there had been no case throughout the country: there was at that time a lull, an apparent cessation, which seemed to justify the wish that the cattle show should take place; and had a single outbreak then occurred, the idea would, he believed, never have been entertained in the council-room. The first letter was from himself, and was dated the 3rd of May:

"My Lord Duke,—I duly communicated to the Council of the Royal Agricultural Society of England the views of your Grace and the other Lords of her Majesty's Privy Council on the question of allowing the Society's show of cattle to be held at Bury in July. The Council, upon being informed of the strong public grounds which made your Grace and the other Lords of the Council decide not to allow any exhibitions of cattle to be held during the next few months, resolved not to appoint a deputation or take any other steps to induce the Privy Council to reconsider their decision. It was felt, however, that the disappointment of the inhabitants of Bury and the neighbourhood, who have subscribed largely towards the expenses of the show, would be extreme; and for their satisfaction, as well as for the information of the members of the Royal Agricultural Society of England generally, I am instructed to request that your Grace will do me the favour of allowing your secretary to furnish me, in writing (for publication), with the reasons assigned for withholding the desired permission. It will be in your Grace's recollection that the principal grounds on which I supported the application were: 1, the apparent cessation of the cattle-plague; 2, the fact that store cattle markets are now permitted at various places, and especially at Bury St. Edmunds, where the show of the Royal Agricultural Society is to be held; 3, the comparative absence of danger in exhibiting carefully-tended animals of great value, every imaginable precaution being adopted both in their removal and on their arrival in the show-yard, as contrasted with the risk arising from the assemblage and ordinary market treatment of store cattle of all kinds, from all quarters, and in every stage of condition or want of condition: 4, the entire sanction and approval of the local authorities.

"(Signed) H. S. Thompson."

The reply was as follows:

"Privy Council Office (Veterinary Department),
"Princes-street, Westminster, S.W.,
"May 7th, 1867.

"Sir,—In reply to your letter of the 3rd instant, addressed to the Lord President, I have the honour to inform you that there are still several infected places in the country, three new outbreaks having occurred during the last four days. The risk of spreading cattle-plague by exhibitions appears to be much greater than it would be by store stock markets, as, whatever be the class of animals exhibited, the area from and to which it would be worth while to move them, in the former case, would probably be much more extensive than that in the latter. The Lords of the Council, therefore, consider—1, That if their lordships were to allow exhibitions of store stock like that of the Royal Agricultural Society to take place, the risk of spreading the disease would be thereby increased, without a corresponding increase of advantage to the public. 2, That, so long as the danger of the cattle-plague spreading is such as to render it necessary to place the country generally under severe restrictions, which must seriously interfere with the ordinary course of trade in animals, their lordships do not feel themselves justified in relaxing any of such restrictions in favour of a society whose object is to improve the breed of cattle, by collecting them for exhibition from all parts of Great Britain—an object which cannot be accomplished, at the present moment, without considerable risk.

"(Signed) Alexander Williams, Secretary."

The Chairman concluded by saying that although the meeting was a small one he should be happy to hear remarks or suggestions from any of those present.

Dr. Crisp said he considered the subject of the cattle plague much more important than that of steam cultivation; and so strongly did he feel upon it that he wished to propose the following resolution:—"That, in the opinion of this meeting, during the existence of cattle plague in this country, and for some time after its disappearance, all foreign cattle used for food should be slaughtered at the ports of landing; and all store cattle kept for 21 days in quarantine." He apprehended that if anything were to be done by the Society in relation to that matter, the sooner it was done the better. He believed the disease would be disseminated throughout the country as it was in 1865 unless great care were taken.

The Chairman observed that Sir Massey Lopes intended to propose a resolution of a more general character.

Dr. Crisp said as that was the case he would withdraw his own.

Mr. Rolton expressed a hope that the Society would not have too many lectures during the coming year on the diseases of animals; adding that the effect on his own interests of a lecture in that room on the diseases of pigs, which were of course liable like other animals to disease and death, but on the whole were wholesome food, was that he had had to sell his pigs at the rate of 5½d. per lb. instead of 7½d.—the price of mutton (laughter).

The report was then adopted.

Sir Massey Lopes said he had prepared a resolution, which, after having been improved by the Chairman, stood as follows: "That the Council be requested to give their special and immediate attention to the Government bill on contagious diseases among cattle, and to appoint a deputation to represent their views to the Lords of the Privy Council, as well as to impress upon them the importance of enforcing the slaughter of all foreign cattle at the ports of disembarkation during the prevalence of cattle disease in the countries from which they are brought." He knew that some gentlemen were adverse to the slaughter of foreign cattle at the port of entry, on the ground mentioned in Parliament on the previous evening, namely, that the public would suffer in the increased price of meat. It appeared, now, that during the twelve months when the cattle-plague was prevalent, and there was so much compulsory slaughtering, the average price of beef was only one farthing per pound higher than in the previous year. He did not think, therefore, that the argument with regard to increased price was at all valid.

Dr. Crisp said, although he should not oppose the resolution of Sir Massey Lopes, he preferred his own, adhering as he did to the opinion which he had already expressed in favour of slaughtering fat animals at the port of landing, and subjecting store cattle to twenty-one days' quarantine.

Mr. Dent, M.P., said he was happy to second Sir Massey Lopes's resolution, mainly for this season—that it involved the consideration of a Bill that was pending before Parliament. He thought that one great fault of that Society in past times was that, in consequence of its being too shy of infringing at all on the literal terms of the Charter, it had often neglected to deal with most important subjects connected with agriculture because a measure relating to them was pending before the Legislature. There were many subjects of that kind which had no political bearing whatever, and he believed the words of the Charter were not intended to apply to such questions. Had the voice of that Society been heard in Parliament in relation to such questions, there would not have been such a universal feeling as there is now throughout the country in favour of Chambers of Agriculture.

Mr. SYMES believed that slaughter was the only cure for cattle plague.

Lord WALSINGHAM observed that by the Bill of the Government it was proposed to give the Privy Council power to make orders and regulations, and withdraw them whenever it might be necessary to do so. It had been particularly pointed out in Parliament that it was impossible to pass a Bill, the provisions of which would be applicable under all circumstances. In the beginning of the last session, the difference of opinion in Parliament was so great that it was manifestly desirable to leave a certain amount of discretion to the Privy Council. It appeared that within the last year, or from the time of the passing of the first Bill on the subject, no less than 140 Orders in Council were issued, and, though it was of course very inconvenient to have such an immense number of Orders, the fact that so many were required showed the impracticability of Parliament's establishing a uniform system.

The resolution was then put and carried.

On the motion of the Chairman, seconded by Colonel Towneley, a vote of thanks was given to the auditors.

Mr. ASTBURY acknowledged the compliment.

Sir H. VAVASOUR said he had great pleasure in proposing that a vote of thanks be given to the President, adding that if the office were permanent, there was no member of the Society he would rather see occupying it.

Sir W. STIRLING, in seconding the motion, expressed his full concurrence in what fell from the mover.

The motion having been put by Lord Walsingham, and carried by acclamation,

The CHAIRMAN said he felt exceedingly obliged to the meeting for this expression of approval. He should, he remarked, be the first person to vote against a perpetual presidency, believing it to be a great advantage to have a periodical d ccession of Presidents, bringing fresh ideas to bear on the eliberations of the Council.

The meeting then separated.

CENTRAL FARMERS' CLUB.

THE BEST MEANS OF HARVESTING CROPS.

The concluding monthly meeting of the Club for the season took place on Monday evening, May 6, at the Club-house, Salisbury-square, the chair being taken by the president for the year, Mr. E. LITTLE, of Lanhill, Chippenham. The subject fixed for consideration, introduced by Mr. G. P. Tuxford, of the Strand, was "The Importance to British Agriculture of the Employment of Reaping and Mowing Machines."

The CHAIRMAN in opening the proceedings said the subject about to be introduced was a very important one, not only to the producer but to the consumer, and he hoped the remarks of Mr. Tuxford would be followed by a good practical discussion. Most of those who heard him would remember that farmers were scolded and lectured very much during the disastrous harvest of last year, by some of the daily newspapers, respecting the proper manner of harvesting their crops. He hoped the discussion of that evening would take a much more practical turn than did the articles to which he alluded; for never was more vapid trash ever strung together than in that instance. It was, indeed, a case of "teaching one's grandmother to suck eggs" with a vengeance.

Mr. TUXFORD prefaced the reading of his paper with some remarks in explanation of the circumstances which led him to undertake the introduction of the subject on the card. Long, he said, as he had been a member of the Club, he had always adhered to the rule which he had laid down for himself of not expressing an opinion on the practical agricultural questions discussed in the presence of practical farmers, except on one occasion—namely, when Mr. James Howard towards the close of last year, after having twice crossed the Atlantic to see what he could learn in America, gave the Club the benefit of his observations. Having on that occasion, unfortunately for himself (laughter), ventured to express his approval of his friend's paper, more particularly of that part of it which related to the use of machinery in the ingathering of corn and other crops by their Transatlantic brethren, he was requested by the Committee to introduce that subject for discussion; and hence it was that he stood in that novel position. He regretted that, owing to peculiar circumstances, he had not been able to devote much time to the work of preparing for the discussion. He had been engaged that day in prosecuting a tedious struggle with the Crown, that had extended over the last year and a-half, and this had absorbed all his time and attention. The importance of the subject for discussion was illustrated by the position in which farmers were placed last year as regarded harvest operations. The process of ingathering last autumn was very protracted, and a lack of machinery, combined with a scarcity of labour, in many cases increased the difficulty. If English farmers generally had had the same facilities for harvesting as prevailed in America, their position would manifestly have been much better (Hear, hear). In the paper which he had prepared, he had no fault to find with farmers for anything they were doing; while as regarded those who usually took a leading part in the discussions of that Club, he would merely say that he admired them as the pioneers of that improved system of agriculture which formed an important element of progress in the present day. But they all knew that there were numbers outside that Club who were likely to be benefited by the reports of the proceedings there. As to the use of machinery, he was thoroughly convinced that in farming, as in other avocations, the man who employed the best was the man who was most likely to succeed in life (Hear, hear). The reaping of corn had, since the introduction of the reaping machine, been a matter of comparative ease to those who possessed that advantage. Mr. John Hudson, of Castleacre, had, he believed, gathered in the course of a day 60 acres of barley.

Mr. LEEDS observed that that extent was, he thought, only severed, not gathered, in a day.

Mr. TUXFORD said they must at all events all agree that it was desirable that crops should be gathered with the least possible expense, and with the greatest amount of power and speed; and he hoped that his paper would tend to elicit valuable opinions on those important points. In conclusion, he remarked that, as he felt exhausted by the labours connected with the matter to which he had before alluded, the Secretary had kindly undertaken to read the paper on his behalf.

Mr. H. CORBET then read as follows: The subject of this evening's discussion is the Importance to British Agriculture of the Employment of Reaping and Mowing Machines; and at the outset I beg to observe, that it is my intention to take the broadest possible view of the question, and not to recommend this or that particular machine, or the principle upon which any one of them is constructed. In this respect, it is to be supposed that, after an examination of the working of different machines by his own personal inspection, every farmer will be the best judge of which one is more particularly adapted to the circumstances of his land, and other considerations to which it is unnecessary for me to refer. My object, therefore, will be to show, upon the broad principle of universal utility (so far as the harvest is concerned), that the reaping and mowing machines are, next to the steam-plough and cultivator, the most valuable and important adjuncts to the working apparatus of the farm that have ever been introduced, and that upon their employment depends not only the proper and timely security of the crops, in the cutting of which they are immediately employed, but that their use will, in its results, frequently promote the success of those of the following season. And not only this, but that the whole routine of husbandry, from the beginning to the end of the season, may be influenced and advanced, if advantage be taken of the time saved and the facilities thus afforded. Having premised thus much, I shall now proceed to show in what way these and other benefits may be derived from the employment of the reaping and mowing machines. My first allusion will be to the weather. Every farmer knows the loss and vexation attending a harvest protracted indefinitely by a succession of wet weather, and the difficulty of securing a crop of grain, of whatever description, in good condition in a fickle time. Under the *régime* of the sickle and the scythe the process of cutting the corn was slow and tedious, and the whole staff of labourers, besides numerous outsiders hired by the piece, were necessarily employed in the operation.. Frequently too, when hot weather supervenes, the wheat becomes dead-ripe all at once, and requires immediate reaping; otherwise great loss is sustained by the grain being shed on the ground, unless extra hands are employed in the first instance, which involves of course additional expense. We had an instance of the misery and loss attending a wet harvest during the last season, more especially in the northern counties, where the wheat and other grain remained on the ground after cutting, for months, until it was perfectly rotten and unfit for human food. Fortunately of late years we have not known another general harvest of that description; but there are men living, with whom we have conversed on this subject, who can recall the harvests of 1800 and 1816. In those two seasons scarcely a dry sound sample of corn of any description was saved, and wheat rose to fabulous prices. Now, without pretending to show that the use of the reaping and mowing machines would alter or even modify directly the character of such seasons as these, I may and *do* say that the farmer who employs those implements can avail himself of a dry day (which may be exceptional) to cut and carry a portion of his corn at such an interval of sunshine, which even the most unfavourable seasons do afford. An example of this facility will perhaps illustrate what I mean. A foreman was some years since directed to go to a farm in an adjoining county to inspect the working of a particular machine. On arriving at the homestead he saw a waggon loaded with sacks filled with barley standing at the barn-door. On inquiry he found that on the previous morning the same barley was standing *in the field*, and that in the interval of four-and-twenty hours it had been mown, carted, thrashed, dressed, put up in sacks and loaded ready to be delivered to the maltster. Such expedition would have been impossible under the old *régime* of the scythe. On the same occasion, the farmer was about to put the mower to work on another field of barley (also dead ripe), having a full plant of clover nine or ten inches high. He was about to mow the whole field close to the ground, under the idea of improving the quality of the straw by the mixture, for the use of the cattle. The visitor suggested that as the barley was dead ripe, it would be better to cut it *above* the clover, by which, in a fickle time, it would be ready for carting at once; whilst, with the clover amongst it, it would require several days to weather it; and, on the other hand, he could afterwards either mow the clover for hay, or feed it off, as occasion required. Now, with the scythe, in neither of the above cases could the corn have been cut in the time, or in the manner recommended with the latter crop, even if the whole staff of harvestmen had been employed about it. The machine required only two or three men to work it, the rest being engaged in gathering and carting, or in other work, as the case might be. The next question is that of labour, which is likely to become one of vital importance to the farmer, owing to certain social and political circumstances, over which he has no control. Formerly, England was visited annually, at harvest-time, by a vast number of Irish labourers, who, using only the reaping-hook, were employed by the farmers in cutting the wheat, which they performed at so much per acre; so that the master had only to see that the work was properly done. This, however, was attended with considerable additional expense, and materially reduced the profits of the farmer. Such a source of supply is now cut off by the wholesale emigration of Irish labourers to the United States, or to the British colonies; and the farmer must consequently rely upon the native and local supply of labour. Unfortunately, owing to similar and other causes, this is daily becoming scarcer and dearer; and the farmer has now a problem for solution which nothing but the more general employment of machinery can solve, namely, how to perform a large amount of work under an improved system of agriculture with a diminished number of hands? But even this is not the whole of the case in respect to agricultural labour; for, taking a leaf out of the book of the manufacturing operatives, the rural population is now exhibiting a restlessness and uneasiness on the subject of wages that bids fair to assume an almost national importance. Strikes are a modern invention for coercing the employers of operatives to increase the rate of wages, or to lessen the hours of labour. I shall not enter upon the question of the sufficiency, or otherwise, of the prices paid for agricultural labour, only remarking that it is one likely, in a material degree, to affect the position of British agriculture itself, unless the farmer finds an expedient to lessen the demand for hand-labour, in the greater and more general use of machinery. In the United States of America, as shown by Mr. James Howard, in his excellent paper read before this Club in November last, the use of machinery is an indispensable necessity, on account of the small amount of manual labour procurable. It is estimated by American writers that, on the average, there is not more than one man and two-thirds to every two hundred acres of cultivated land; so that without machinery it would be impossible to either reap the crops or cultivate the ground in a proper manner. The number of reaping and mowing machines (sixty) exhibited for competition at the agricultural meeting at which Mr. Howard was present shows the importance attached to the use of those helps in that country. In America, therefore, machinery to a great extent supersedes hand-labour in agriculture: at the same time, it must be admitted that the amount of the latter is still insufficient for a proper cultivation of the soil. Returning to our own country, where competition with the foreign grower and an advancing price of labour place the farmer as it were between two fires, it is doubly necessary to resort to machinery, even if no other advantage accrued from it than that of lessening the amount of hand-labour required. I am far from wishing to see the agricultural labourer oppressed and ground down to the earth, as has formerly been the case in some districts of the country; but I look upon the introduction of machinery upon the farm as the regulator that will tend to settle the balance between labour and capital in that branch of industry, as it has in the cotton factories of the North, by economising hand-labour at those periods when it is of the most importance to do so. But the foregoing are not the only advantages to be derived from the use of mowing and reaping machines: other collateral and consequential benefits accrue therefrom which do not perhaps at first strike the mind of the observer. It is now generally admitted by all advanced agriculturists that autumnal tillage of the stubble lands and fallows, in preparation for the succeeding crops, is of essential importance. On the other hand, by the employment of these machines the duration of harvest is shortened by from a week to ten days on the average, thus making room for the plough to perform its task before it is engaged in the preparation of the land for wheat-sowing. No one can calculate the benefit of thus having the stubbles "laid up" in the rough, to receive the ameliorating influence of the winter's frost and snow; but I have no hesitation in asserting that if the week or ten days thus saved from the harvest is properly improved by the farmer, it will frequently make all the difference to him of a good and a bad crop, of whatever kind, whether of roots or spring corn. But this most necessary and valuable work is frequently omitted, because a protracted harvest and shortening days throw the work on heaps, and press upon the more important work of wheat-sowing, rendering it impossible to attend to that of autumnal tillage of the fallows. Having thus briefly endeavoured to point out the advantages accruing to the farmer from the employment of these most useful machines, I must not close without also alluding to the benefits the labourer himself derives from them. Harvest work, however joyous to him who employs, is no child's play to the workman himself. It is true that to a young and healthy man accustomed to farm-work the labour of reaping and mowing, though heavy, is not overwhelming. But such is the most onerous of the work of the farm; and many a man who has arrived at the age of fifty finds it difficult and painful to keep up with the gang, and is generally in the rear of his fellows. Every other operation of the harvest can be performed by him with ease; but, after so many years of exposure to the alternations of the weather in this fickle and capricious climate, changing from wet to dry, from heat to cold, by sudden transitions, the limbs become stiff and the bodily powers enfeebled at the age I have stated, while the posture required in handling the scythe or the reaping-hook is accompanied with weariness and pain. What a blessing, then, must be the mower and reaper to the harvestman, remitting as they do the most laborious part of the field operations! I believe that any medical man will bear me out in saying that the adoption of these machines and of the thrashing machine will tend to lengthen the average life of the agricultural labour by many years, besides enabling him to perform the operations of husbandry with ease and comfort, as certainly with much greater efficiency and despatch. In conclusion, I beg to add that the advantages above enumerated as accruing to the husbandman from the use of these machines are sufficiently general to establish their claim to the character of a national benefit. Any invention that tends to ameliorate the condition of a class of the community may be with propriety considered in that light—especially if, with other objects, it promotes the health and the duration of the physical powers, and, consequently, the life of the labourer. Such is the case with the extended use of agricultural machinery, and it is therefore to be hoped that the employment of reapers and mowers will become, like that of the thrashing machine, *universal.*

Mr. R. LEEDS (West Lexham, Brandon, Norfolk) said Mr. Tuxford had alluded to his neighbour Mr. Hudson, who got in his harvest as quickly as most people in this country. He believed Mr. Hudson had cut as much as 40 acres a day by machinery, and his harvestmen had cut 12 acres before breakfast, and carted 50 acres after during the day, making in all, cut and carted, 102 acres—a pretty fair day's work (Hear, hear). In his (Mr. Leeds') own experience he had always found that the quickest and cheapest way of getting harvesting done was to put it out by the lump; in other words, to give men so much money to clear the land (Hear, hear). Under that system the labourers had an equal interest with the master; and if the master only looked after them, and gave them a pint of beer or two a day extra, they would soon finish. His harvesting generally cost 11s. 6d. an acre; but, then, they did not grow very heavy crops, the land of his district being poor. In some other districts—for example, in his friend Mr. Skelton's—the cost was much greater, the crops being perhaps almost double in quantity. In his own district the practice was to give men the same money, whether the harvest occupied three weeks or a month. There were so many acres of corn to be severed and so many to be carted, and as soon as the work was done the amount previously fixed was paid.

Mr. W. CROSSKILL (Beverley) said he hoped Mr. Tuxford would not think any worse of him if he found a little fault with his manner of introducing the subject. In his opinion that gentleman had taken too limited a view of the question; for, the subject on the card being "The best means of harvesting crops," he had given them a treatise on the reaping and mowing machine. After the reaping and mowing the crops had to be gathered and stacked, and it was to be regretted that Mr. Tuxford had omitted that portion of the subject.

Mr. TUXFORD observed that he did not wish to venture out of his depth.

Mr. CROSSKILL continued: It was a very interesting question how corn could be best carried home after it was cut. Some of the older members of the Club might recollect a very important investigation which was made some years ago by the late Mr. Philip Pusey, as to the comparative advantage of carting with waggons or with carts, and he thought it was then shown that three horses with carts would do as much work as four with waggons, and he hoped that before the discussion closed something would be said by practical men on that subject. As regarded the employment of machines, Mr. Tuxford had no doubt correctly described the present state of affairs. Farmers were very ready to use machines, and found great advantage in so doing. A great advance had been made of late years in that part of the process of clearing the land, and what Mr. Tuxford had said on that subject would be fully borne out by practical men. Mr. Leeds' advice to give labourers plenty of beer reminded him that machines ought to have plenty of oil.

Mr. JAMES HOWARD: Let it be good oil too (Hear, hear).

Mr. CROSSKILL continued: He would not enter into the question of the comparative merits of different kinds of reaping machines. Every farmer must judge for himself what machine was best suited to his own locality. A machine which did very well in one place would do very badly in another; and in some cases a reaping machine was a nuisance instead of a benefit (Hear, hear). He would therefore recommend farmers not to purchase a machine until they saw what kind of machine was best adapted to their special circumstances (Hear, hear).

Mr. T. B. **Dring** (Claxby, Spilsby) said as regarded reaping machines he supposed there was a reason why farmers had begun to think so much about using them: it was probably the same reason that led the Americans to have recourse to them—a pinching in the labour market, especially at harvest-time. Land in this country was much better cultivated now than it was when he was a boy. At that period the land was badly cultivated; the seed-corn was put into it at various times and in various conditions, and as it did not come up together a longer time was allowed for harvesting. He remembered the harvest extending over eight weeks. Now the cultivation of the land was greatly improved; the seed being put in in time, the crops came nearer together than was formerly the case, and hence the work could be done better within a given time than under the old system of farming. A greater weight of produce was grown, and consequently there was required a greater amount of labour. These were no doubt the chief reasons why there was a deficiency of labour for the getting-in of the crops, and farmers had been obliged to have recourse to reaping machines, and one of the best implements the farming interest possessed. The better a crop was, or the riper, the more necessary it was that it should be cut in a short time, and they had to prepare to meet that difficulty. He found that even with reaping machines at his command his corn ripened faster than he could get it cut. They should always take care to get all other work done in preparation for harvesting. The harvest time came very often "like a thief in the night," and as a great many men would be required, all the work connected with turnips, thistles, and so on should be completed beforehand (Hear, hear). He thought that, as a rule, harvesting was not begun soon enough by about three days (Hear, hear). The labouring populations of a district would generally suffice to get in the harvest in about 18 days, and it would be a great advantage if by getting everything close done early the farmer was enabled to begin three days before the crop had become dead ripe (Hear, hear). A gain of three days in eighteen would, of course, be one-sixth, or more than 15 per cent., and beginning three days earlier, they would not have much difficulty in getting in their crops well, except in very wet seasons. It might sometimes have been supposed that he had begun too soon; but while he had often regretted beginning late, he had never regretted beginning early. He had found that wheat which was cut early was finer in the skin, less rough and coarse, weighed heavier, and made a shilling or two more at market than wheat which was cut late (Hear, hear). Wheat was the heaviest when the kernel had the greatest amount of sap, and this was the case when it was cut early. He thought, therefore, that the difficulties which they met with in some seasons, might be met by using reaping machines and cutting early. As regarded what Mr. Tuxford said about cutting corn by candle-light, that would be all very well if there were two sets of labourers. He had found that his men had quite enough to do if they worked well in the day, and he did not see how they were to work by candle-light. He was himself a practical man, having cut corn, carted it, and thrashed it, and when he had worked well by day he was not in a fit state to work at night.

Mr. S. **Skelton** (Suttonbridge, Wisbeach) was glad that Mr. Dring had given the Club the results of his practical experience on this subject. He wished, however, to ask him what he thought was the relative proportion between the expense of labour and the use of machines; that is, what was the fair cost to be put down for the machine, with a man and pair of horses, and the fair cost to be put down for gathering, tying, shocking, and raking, after the machine had done its work?

Mr. **Dring** inquired whether Mr. Skelton wanted to know the difference of cost between cutting with a machine and cutting with the scythe.

Mr. **Skelton**: No. He daresay that, generally speaking, farmers approved of the use of reaping machines; but it was a practical question in his own neighbourhood what allowance should be made to the labourer out of the cost of the reaping machine.

Mr. **Dring** replied, that if the corn were cut with a machine, he would take off about one-third; that is, supposing the whole of the work to be worth 15s. an acre, he would allow the men two-thirds for tying up the crop, shocking it, and making it fit for the waggon. He thought that was a liberal allowance; but it was policy to give the men the long end of the stick by way of encouragement. If the crop were worth 9s. he would give them 6s.

Mr. R. **Leeds** observed that in his neighbourhood farmers seldom charged anything for the machines; they gave the men the use of them, and considered that they got in the harvest three days earlier (Hear, hear).

Mr. J. **Clayden** (Littlebury, Saffron Walden) said his experience was very much like that of his friend Mr. Leeds. In his neighbourhood they were very well off for labourers. They used machines to a certain extent and gave the men the benefit of them. The price for cutting and carting corn, including every description, was generally about 11s. an acre, including everything. For that amount men generally stacked, carted, and did the whole work. He quite agreed with Mr. Dring as to the importance of getting everything done ready for harvest operations, so that there might be nothing to impede them when the time for commencing had arrived. All such operations as turnip hoeing where possible, the cutting of hedges, and the chopping of thistles should be done in anticipation of the harvest. Last year, some farmers in his neighbourhood got behind in those respects; and the consequence was that they suffered very greatly. He found that with the scythe a man, with his wife and family, earned a great deal of money; and, besides that, corn cut with a scythe would stand wet better than corn cut with a sickle. When corn was cut with a sickle, and bound closely together, the water was held in it, and the grain was swollen and injured; but when corn was cut with a scythe or a reaping machine, it was held more loosely, the water ran through it, and its quality was not much affected by wet. The reaping machine increased the amount of dirt in the sample (Hear, hear). A large quantity of dirt was carried up by the wheels; and it got into the sheaf, and was thrashed with the corn in the wet weather that was experienced last harvest.

Mr. **Pigeon** (Messrs. Samuelson and Co.), after remarking that he felt that he was open to suspicion in addressing the Club on such a subject, gave some statistics collected by his firm, to show the relative cost of reaping by machine and by hand, and contended that the use of machinery caused a saving of forty-one per cent. He agreed with preceding speakers that machines did not act so well on heavy lands in wet seasons as in dry ones, but maintained that, on sandy soils, the advantage of using them was almost as great in the former as in the latter. He fully concurred in what had been said as to the necessity of being quite prepared for harvest operations, but thought that one of the best means of preparing was to be provided with reaping machines (laughter).

Mr. L. A. **Coussmaker** (Westwood, Guildford) said, the subject on the card being "The best means of harvesting crops," he supposed it embraced wet seasons as well as dry ones. In a fine season harvesting was straightforward work, and there was very little difficulty. In a wet season it was a ticklish matter. There was the cutting of the crop, the carrying of it, and the question where it was to be carried to. In fact, the subject was a very wide one; and some portions of it had not been alluded to at all that evening. The tendency of opinion that evening had been in favour of using machinery; but there were certain farms on which it could not be employed with advantage, and his own was an example of that kind. He had a heavy-clay farm, with small lands, in which a reaping machine would not work: it would work across the land, but would not do so at other parts of the field. As to the mowing machine he had found it invaluable. He had employed it ever since the wet summer of 1860, and he had made his hay, cutting it with the mowing machine, and performing with haymaker and horse rake all the work with very little manual labour. But the case was very difficult with regard to cereal crops. He was an old-fashioned man, and there were certain rules by which he had always abided. One of those rules was never to cut corn unless he could tie it up. Another rule was never to allow a larger sheaf to be made than could be spanned by three hands. A large sheaf that had once got thoroughly wet never, scarcely, became dry again. So much for the cutting. As to the harvesting, many persons thought that in order to save time it was best to stack in the field (Hear, hear). There were, he admitted, advantages in that course; but how was the corn to be thrashed out? The plan nowadays was, he was aware, to thrash in the field with a steam-thrasher (Hear, hear); but if a fine morning were followed by a wet afternoon, they might be caught in the operation. He had always made his stacks of such a size that the thrashing could be done in a day, not considering it safe to let the work extend over two days. If he were a sheep-farmer, straw would be of comparatively little value to him; but as his farm comprised about an equal quantity of arable and meadow land, and he kept a large number of cows, the straw was almost as valuable to him as the corn itself. He had suffered great loss from threshing and being caught in bad weather; his strawhad, in consequence, got damaged, and the cavings, which were of great value to him as fodder for his cattle, had in some cases been almost good for nothing. Again, there had been great complaints in his part of England—he was not talking now of wide open fields of 100 acres, but of fields averaging from 10 to 30 acres—that the stacks in the fields had caused them to be run with rats. They had in fact suffered from rats to an almost incredible extent. In a field of beans, where timber or hedges were near the stack, he had lost half an acre. There were perhaps fewer rats about the buildings than there were formerly; but then they were concentrated about the field-stacks; and whereas in the buildings they could be easier got rid of, being killed by bushels, in the fields it was almost impossible to destroy them. He had done all he could by means of ferrets, poison, and so on, but without much effect, and this evil was to be attributed to the practice of making stacks in the field. Rats were in fact as bad as rabbits. He thought the best mode of harvesting was to bring the crops to the homestead, building the stacks on straddles, and making them long, high, and narrow, so that the wind would go through them. The effect of making the stacks in this form last year was wonderful. Through the adoption of a system of having narrow stacks, the corn was prevented from receiving as much damage as it otherwise would have done, and the result was very satisfactory.

Mr. J. A. Nockolds (Stort Lodge, Bishop's Stortford) said he must rather demur to an observation of Mr. Dring's. That gentleman said that by cutting wheat early before it was quite ripe they got a *greater* weight. The question was whether, in an early and fixed season, it was best for wheat to be cut early or late. If wheat were cut before it was ripe, it might be somewhat less in weight, but there would be a capital sample for the miller; whereas if wheat were left until nearly dead ripe before cutting, and a little wind should arise, much of the crop would be lost, though of greater weight.

The Chairman, in summing up the discussion, said he was sorry there were not more members present to give the benefit of their experience; but the discussion had been practical, although Mr. Tuxford's observations had been confined principally to the use of reaping machines, which did not complete the whole of harvesting. He must say the remarks of Mr. Dring were about the best he had heard on the subject. As regards the period of cutting wheat he (the Chairman) thought that when cut early it took much less damage in the field in wet weather than when let to get in a very ripe condition, and there was certainly less waste. In the county in which he resided (Wiltshire) the use of reaping machines had not up to the present time been much in fashion. It was customary there to measure out the land in the spring of the year in small lots of about one acre each, and when the time of cutting arrived, to give each man with his wife and family a lot, and following on one after the other the whole field was taken, and so cut very much together, and in as short time as possible after it was fit for carting together. In the present state of the labour market that plan was not so easily carried out as it was formerly, but it had generally been found practicable up to the present time on the hill farms. They never expected an influx of Irish or other labourers now, being confined very much to the labourers of the parish; the general system was to let the cutting *only* at so much per acre, and not in the manner mentioned by Mr. Leeds as practised in Norfolk; the only piece work was the reaping, the carting and stacking being done by the carters and ordinary farm labourers, who during harvest (six weeks) received extra wages, to the amount of one-third, with an unlimited supply of beer—a system which had generally been found to answer. No allusion had been made to barley by any of the members; that grain, he considered, required to be cut in a much riper state than wheat; it should be well ripened to obtain a good sample. Barley required to be in swathe a few days; if left for two or three days, and it had one or two turns, the sample would be much improved. As no one had mentioned the harvesting of other crops, he would not at that late period of the discussion say any thing on that part of the subject.

Mr. R. Marsh (Sandwich) said, living as he did in a large barley district, he wished just to remark, before Mr. Tuxford replied, that the adoption of the practice of binding barley at the time of cutting instead of letting it lay in the swathe, was becoming more and more general there every year.

Mr. H. Cheffins (Easton Manor, Dunmow) desired to add that he thought wheat took less harm in wet weather than barley and oats, when lying in swathe. If the shocks of wheat were practically covered-in with a cap sheaf the damage would be comparatively small to it, and more attention given to loose corn.

Mr. Tuxford, in replying, said: Like the Chairman, he was glad that his paper had elicited such a practical discussion. He entirely concurred with Mr. Dring as to the desirableness of getting in the harvest as quickly as possible. On visiting Hampshire last year he saw an immense amount of farm produce exposed to the varying influences of the climate. He was told that that arose from the scarcity of labour, but he found that where the reaping machine was used the harvest was carried. As to Mr. Coussmaker's remark that he was an old-fashioned farmer, it was necessary to remember that this was not an old-fashioned age, and that they must all endeavour to keep pace with the spirit of the times. He felt that he ought to apologise for his temerity in saying so much in the presence of practical farmers, and he would not trespass any longer on their attention.

On the motion of Mr. R. Marsh, seconded by Mr. J. Bradshaw, a vote of thanks was given to Mr. Tuxford for his paper, and a similar compliment to the Chairman terminated the proceedings.

THE PRESENTATION OF A TESTIMONIAL TO MR. C. DUCKHAM.

The presentation took place at a dinner at the Mitre Hotel, Hereford, on Wednesday last. The Rev. Archer Clive presided, and on his right sat the guest of the evening, Mr. Duckham; Mr. Jancey filling the vice-chair. The company numbered about 80.

The Chairman, in proposing the toast of the day, said: I know nothing of which any man may be more justly proud than the unbiassed and unasked for esteem of his neighbours and fellow-countrymen, manifested on such an occasion as the present. There are a great many occasions on which testimonials are presented, when two or three busy men press, and shy men don't like to refuse, but when many of the subscribers would rather have let the testimonial alone. But the letters and contributions we have received, not only from this county but from every part of England interested in agriculture, show us that this testimonial is not one of that sort or nature. On the contrary, it is one that has been earned by long, faithful, and disinterested services, for I feel I can truly say that Mr. Duckham has rendered us and the farmers of Herefordshire who are interested in preserving and improving our excellent breed of cattle great service by the compilation of the Herd-book. I may say that every one throughout England is interested in our beautiful breed of cattle; and I may state that when I came into this room I found a letter from Mr. Lort, of Birmingham, who said that it was only through the newspapers that he had heard of the dinner and testimonial to Mr. Duckham, but that, concurring in the object, he begged to enclose his subscription. This is not a solitary instance, nor one of a dozen from various parts of England, testifying to the industry, the perseverance, and the good services which Mr. Duckham has rendered to the cause of Herefordshire stock and agriculture in general. When the cattle-plague was frightening us all, and we were anxious to indemnify those parties who had suffered loss from that fearful calamity, Mr. Duckham's exertions were not wanting—whether with his pen, his tongue, or his contributions—to aid in the work. It is to him, again, that we are indebted for the meeting of the Bath and West of England Society in Hereford, which not only enlivened the city and caused a great deal of money to be spent and much valuable information to be communicated to us, but led to a great many men of eminence becoming acquainted with this part of England, of which they had previously known nothing. We were much disappointed in not having the meeting of the Royal Agricultural Society here, but I think we were almost indemnified by the excellent meeting of the Bath and West of England Society. Now these are services which many men wish to render to their neighbours, and which many men would take a journey or some trouble to render; but we find few men who go on labouring year after year, devoting their services to one useful object and another for the public benefit. This Mr. Duckham has done, and I am sure that in the acknowledgment which we this day offer to him we are not in any way exceeding his deserts, but simply paying a tribute of our thankfulness for his exertions and showing that we are not ungrateful for the services which he has so efficiently rendered.

Mr. Duckham, who was received with hearty and continued cheering, said: It is, I assure you, with a grateful heart that I rise to acknowledge the very kind compliments which you, sir, have been pleased to pass upon me, and to thank you, my kind friends, for the very handsome and magnificent piece of plate which I see before me, which you have been pleased to subscribe for to present me with. I feel that the little exertions which I have used in promoting the cause of agriculture—in compiling the Hereford Herd Book, and in any other services that I have rendered to forward the interests of my fellow-men—are undeserving of the handsome tribute which you have been pleased to pay me this day. The worthy gentleman, Colonel Feilden, has told you that the highest pride of a soldier's heart is that in his conduct he shall meet with the approbation of his countrymen at home; and I assure you that it is the highest pride of my heart to meet with the approbation of my fellow-men in the cause which I have been the humble instrument of promoting. And so long as this frail body may be blessed with animation, I trust that it may be directed in the same course that has won from you your cordial approbation, and for me this magnificent mark of your estimation of my public conduct. Mr. Clive has alluded to the Hereford Herd Book, and I must be permitted to say I trust that, when called upon again and again, as I hope you will be, by me for information, you will aid me to your utmost ability in giving me the fullest information possible; because, whatever exertions I may use in the cause, unless the information supplied by you to me is full, and clear, and correct, it will fail in the object we all have in view, viz., that of promoting the beautiful breed of cattle of this county. Before I sit down I wish to call your attention to a noble institution, of which I have done myself the pleasure of taking the part of honorary secretary. It is the Royal Agricultural Benevolent Institution. I have a list of subscribers with me; but really at the present moment this county, although great in its agricultural pursuits, is almost a blank in reference to this excellent institution, for there are very few subscribers to it in the county. Many other counties not half so great, nor so important in its agricultural interests, have added materially to the funds of this institution, which is a very old one, founded for the purpose of affording relief to destitute farmers, distressed widows, and orphan children. On behalf of this excellent institution I beg to plead for the exercise of your charitable feelings, and I hope that I may have the pleasure of adding some names to go from this room to London as annual subscribers, or as contributors of donations to the fund. Again, I beg to thank you.

The last official announcement showed that the subscription-list amounted to £441 2s. 6d., but additions have since been made, so that the account has not been finally closed. This will explain why the amount of "the purse" which formed so substantial a part of the testimonial remains to be filled in, in the inscription on the epergne. This beautiful work of art was manufactured by Messrs. Taylor and Co., of Bristol. Its height is 2 feet 4 inches, and its weight 135 ounces. From the base, which is of a tripod form, rises the trunk of an oak, around which are ranged figures—very chastely executed in frosted silver—typical of three great branches of farm-work, viz., the cultivation of the soil, the sowing of the seed, and the reaping of the grain. The first and the last-named figures are in a state of repose, the one resting in an easy attitude on his spade, and the other having his sickle thrown over his shoulder, but the sower is broadcasting his seed from the hopper. Branches are gracefully thrown out from the trunk of the oak, and at the summit is borne an elegantly-cut glass cake-dish. On one of the shields of the base of the epergne is the following inscription:—

> "Presented to Mr. Thomas Duckham, of Baysham Court, Herefordshire, together with a purse of ——, in recognition of his services in conducting the 'Hereford Herd Book,' and promoting the meeting of the Bath and West of England Agricultural Society at Hereford, and the general interests of agriculture. 1867."

THE NEW FARM.

Well, it's over now; but it was a sad job! Two fine bull-calves, one a rich roan, had to be taken away from the Sir Charles Knightley cow piecemeal, being locked in an inextricable embrace. Luckily we have saved the mother, but it is questionable whether she will be of any use as a breeder again. So it is that, if disposed to be sad, as I am now—having got up very early to finish off some writing—one might exclaim with Moore,

> "Oh, ever thus from childhood's hour
> I've seen my fondest hopes decay."
> * * * *
> "But when it came to know me well
> And love me, it was sure to die."

It is a bright sharp morning, and the birds are very busy arranging for the wedding. I see, however, that a pair of starlings have taken violent possession of the hole in the willow where our friend the nuthatch has annually reared its youthful family. This cannot be allowed; but how to set matters straight is the question, without shooting the enemy, which certainly must not be done. We'll try what pulling out the cradle continually will effect.

I see my neighbour's hopeful returning from an early walk with a victim in his mole-trap. He will not believe me that the glossy little fellow could do him any service, "Him was a mooting up the clover;" and now him will have to be skinned to make a purse for our young acquaintance's occasional halfpenny.

Poor little Vic got into a trap yesterday. She was wise enough thereupon to raise a loud lament, which drew the children down to the spot at once. Since she usually canters after them on three legs, it will not much matter to her, except that she cannot change the favoured foot as she is wont to do, being a thrifty matron and given to saving shoe-leather. One cannot explain satisfactorily to her that she ought not to interfere with the gardener's traps, as her nose leads her involuntarily along the rabbit's track. Luckily there was a good deal of moss strewed upon the teeth, which eased the pinch. She never said a word about it, I noticed, when she was lifted into the box where her puppies are. What a constant source of delight the fat little fellows are to the children upon the lawn after school! They straddle along and bark so affectedly in their feeble cracky way, while the fond mamma looks on approvingly, wagging her tail in perfect confidence. She is wary enough, however, in her generation. She has doubtless discovered that it is worth her while being civil, inasmuch as many are the tit-bits she gets quietly dropped to her at the nursery breakfast. She seems thoroughly devoted to them in consequence, and follows them everywhere; whereas to ourselves or any grown person she gives plenty of sea room. As there is a goodly pack of her descendants now, I hear some talk of a hunt to be organized, the trail of a red herring being led over some fences and a part of the common. Who started the idea? I don't know. I only know that our young French student charged a deep, narrow, muddy ditch the other day, on the old Shetland pony. She being, however, too wise to shake her joints, the youngster took an involuntary header over her into the mire, out of which he scrambled shivering and all but in tears. Cry, however, he did not, at the remonstrance of his indignant elder brother, who immediately remounted the wee one, and sent them over flying, with a circus flourish of his hunting-whip that consternated dame Shetland, and drew the sun out after tears on the jockey's triumphant April face.

Well, it's busy with the "taties" we are upon the Farm. Of this inestimable esculent last year we grew about double as many bushels as I expected to use; but, owing to an attack of dry rot, the ranks have been so fearfully thinned that we shall barely have enough left for seed. Potatoes in every shape and guise—potatoes roasted, potatoes boiled, potatoes in their jackets, and potatoes peeled. They are a delicious food altogether; and reader, gentle reader, did ye ever taste them in combination with butter-milk? Oh! it makes my teeth water at this early hour of the morning, to think of it. If ye have not, then order in a snow-white bowl and a jug of the precious drink. Then peel the ragged jacket of a mealy specimen, and smash it up with your spoon in the basin. Then pour in a small quantity of milk, just enough to cool the vegetable; in a second or two again pour on a lot, and then peg in. Oh! the delicious sensation, passing description, with which a cool spoonful with its potato-island passes down the thirsty throat! Oh! then for the gullet of a crane, as that party mentioned by Aristotle wished, to prolong the happy taste! There is but one drawback—it is a very bilious food; but there is a way of meeting this difficulty. For about a fortnight you may indulge yourself with this diet, but then possibly a head-ache may loom in the distance. The way we do is, on the *thirteenth* day we take a dinner-pill, and start afresh. That's what our Yankee friends term "licking natur'." The butter-milk must be made by churning milk and cream together. When the cream only is churned, it is too oily and rich. On a wild Welsh mountain-side how often have we made thereof a repast a king might covet, followed by a slice of barley-bread, all thickly coated with the sweet golden butter the glen-grass yields, when one has spent the morning fishing all too fruitlessly upon the sunny tarn.

Halloa, there! there are half-a-dozen wild pigeons busy picking up the peas I had strewn for the pheasant-hens which are building underneath the laurels beside the drive. Their turn will come, however, ere long. Every Spring we secure a large wire house-full of the young ones, which grow very fat in confinement, and are ready at any time to furnish a *récherché* dish when a friend drops in. The way we manage is thus: Having found a number of nests, we tie one leg each of the young pair, passing the string through and under the nest. Thus fettered the old birds will continue to feed their offspring until they are full-feathered, when the tree is scaled and we transport them to their new quarters.

I see a prediction in *Land and Water*, respecting some river, that the coarse fish-supplies may be shortened this year owing to the floods; the spawning fish having miscalculated and laid their spawn upon the meadows, where it will perish when the waters recede. We have been interested in the overflow of our noble Wye, having indulged a fond hope that a stray salmon or two returning home during latch-key hours might have got stuck in an unexpected fence. As yet our anticipation has not been gratified, although last winter a fine fellow of about 9lbs. weight was found embedded in the ice, in a gutter upon the meadow, to which he had retired probably in the condition in which Sheridan was found, when with "unerring instinct" he gave the name of Wilberforce to the watchman that disturbed his damp slumber. This fish was in good condition, and was eaten by a labourer's family. At some period of his existence he had been indulged with a charge of shot, which had spotted him smartly.

Local experience is of vast value to every farmer. Of course it is not to be supposed but that the tide of ages, in its ebb and flow, has left a deposit of various quality upon the minds of different districts. Last Autumn we recorded our intention to leave the clover-plant after harvest unfed, expecting thereby to have a superior Spring show to our neighbours', whose practice it is to gnaw the crop right into its heart, with sheep and even horses turned on to pasture. Their argument is, that they cannot get the light soil sufficiently firm otherwise. I hoped that a good rolling would effect this sufficiently. I see now, however, that their maltreated fields are, as regards thickness of root, although not forwardness of growth, far in advance of mine, and yet my land was well dressed.

One more wrinkle for my note-book. I see the rooks have fastened upon a beech-tree before my window, from which they are snapping off twigs with their strong bills, for architectural use in the tall oak beyond. I fear that beech is destined, or it would not be so brittle. It is curious that several of our finest beeches have died during the last eighteen months. There has prevailed some unpropitious influence—the fat gardener attributes it to some frost he recollects. I see some authorities write of whole plantations dying off, and attribute it to "an electrical or pestilential blast." It must have been the comet, I conclude. I wish he'd fold his tail a little closer the next time he approaches our earth. By the way, what can be the language of the brutes? Last week the young terriers had two joints each severed from their tail point. The first one operated on yelped a wee trifle as he felt the incision, but sadly as the executioner applied a touch of lunar caustic to help the healing of the wound. The next brother tightly folded his tail between his legs underneath him on being brought out, as the schoolboy spreads his hands to protect the threatened part, having evidently learnt from his brother's voice what was going on. He was pluckier during the pruning, but winced and wailed under the application of the caustic, kindly meant as was the dressing on our part.

Puppy number three was yet more enduring, and only "weeked" once as the lunar was appreciated. The nursery was horror-struck at the mutilation, and stood aghast at the man's recital of the agonies endured, which our careful bailiff judiciously enlarged upon as being the fate, in one way or another, of all naughty children.

Another wrinkle for me, which, as it comes from my better half, I am evidently bound to believe. The room is deliciously perfumed with the lemon scent of a coronella, of which I have despoiled the green-house show. Moved to my room, I found it disappoint me in the paucity of its fragrance. I concluded that it was vexed by its transportation from its bright garden abode to the region of musty books. My wife comes, however, and throws up a window (she is very fond of throwing a light upon the subject; I often expect that, in an excess of misplaced energy, she may some day, inadvertently of course, make me see a multitude of dancing stars); whereupon immediately out comes the imprisoned delicious sweetness. This is a return for a dodge I taught her, which, if you promise to be grateful, gentle reader, I don't mind telling you. It is that you can preserve a bouquet for a long time in its freshness, if you cut off daily the stalk ends and put some camphor in the water. Talking of water, the dissolving snow has carried away cartloads of the surface of one of our sideland fields sown with oats, tearing up extempore channels with reckless force. I hope the oat-seed may prove acceptable to the cray fish in the brook at the bottom.

Another botheration for which we have to thank our light sandy soil is that it works up into the ewes' claws, eating right into the quick with an effect as irritating as unsolicited advice.

Having just strolled around the premises, I have been greeted more than once with a half-playful "If you please, sir, you were before me this morning; but you'll not be again." I reply, "How is it that whenever I do make one of these forays I invariably am before you?" Be it confessed, *sub rosâ*, that I do not often make them, preferring, as a rule, to read late into the small hours. An occasional upset of this sort, however, acts medicinally on the men for some time to come.

This lovely April morning the bees are busy amidst flowers in the greenhouse, into which they travel by the open door. Alas! that they know not how to stoop so as to get out again the way they entered! "Them fills theirselves so much, them forgets the road," is the gardener's solution of the difficulty. "I puts out as many as I can, but I finds them continually dead about in heaps." It is a pity that the industrious swarm should suffer so, but what ever should we do? It is time to be painting the boat, which has rested the winter through upon its carriage in the barn. The salmon fishing licence, price £1, has just arrived; our pools swarm with fish, but they don't often care to take the fly; whether it is that we are too near the sea or not I don't know. They possibly have their baskets of prog along with them, which last them until they reach the upper waters. The greedy old dowagers in their descent take freely enough, but the fresh-run clean fish are mighty daintiful as regards the baits we present for their acceptance.

Owing to the late severe weather, our chickens' coops are a positive workhouse, the surviving individuals of ever so many separate broods having to be clubbed together to make out a charge for a solitary hen. The ducks are not over-industrious, laying an egg now and then, as the whim takes them, while the turkeys have not commenced at all. Geese I never rear, having plenty in the household. I was much amused the other day by the performance of a bantam which I had purchased, being exceedingly tame, from an old woman by the roadside, for the children. One of the little girls was sitting on the grass with the bird in her lap, on a nest of hay which she had seductively twisted, when lo and behold, after an agony on the bird's part, which the child took for a fit, there was produced a new bright egg. Whether the bird was pleased with the attention paid it, and wished to gratify its mistress, or happened to be caught at the right moment, I cannot say; only what did actually happen, as a faithful historian I record.

"I'll bet all papa's Shorthorns," uttered in a most indignant tone, was an exclamation that startled me the other morning as I descended from my dressing-room. "And pray what are you going to bet my Shorthorns for?" "Oh! papa, only that I could lace my own boots ever since I was five years old." The fact was, there were a pair of them busy putting on their boots, seated on the lowest step of the staircase; and upon our young French friend declaring that he must go and get his laced by the housemaid, who pets him, he got rebuked, as above, by his more independent sister.

To go on with Shorthorns, however, there was much food for instructive reflection at the sale to which I referred. The herd, numbering some fifty head, consisted of very various elements. There were old cows of great value, but very different in appearance, which had been picked up at long figures at some of the celebrated north-country sales, and which this day the representatives of very eminent breeders had travelled many hundred miles to recover, at whatever cost. There was a grand red bull, bred in Yorkshire, of wonderful style and quality, and meat to the hocks, with the very important defect, however, of being rather short-quartered and high over the tail—a defect inherited by almost every one of his stock, which is one proof more, if such were needed, of the impressiveness as regards likeness of long-descended cattle, and the necessity of using none but the most symmetrical as sires. There was a small tribe offered with most attractive names upon their pedigree, but exhibiting throughout a marked Ayrshire look, especially about the head. Generations back, their ancestress was doubtless a cow of that sort. Murder will out; and this was an instance of it. The old lady must have had a strong character of her own to have perpetrated it so far down. The average was about £50 per head, young and old, which, considering how many were ancient and profitless both to the butcher and dairy—how many, again, viewed as ordinary stock, were worth at most a ten-pound note a-piece—was surely a paying price. However, upon this the opinions of the wise will differ. The conclusion I arrived at, and which is confirmed by accumulating experience, is, that anyone possessed of an artistic eye for points, and sufficient capital to keep on a growing herd for some years, by regular attendance at the distinguished sales, and uniform use of one stamp of male, may ultimately bring to the hammer a number of nice things, as like and level as a handful of beans, and which will yield him a precious *quid pro quo*—may, in fact, "make Shorthorns pay." By the same rule, if you go in recklessly, and buy, without reference to a particular type, something of all sorts, as you get a chance, provided they are of the Bates or Booth sort, you will only to have to lament the low return when you clear out.

What a nuisance these new floods are! I had thought that all danger of any more was gone; but there's no trusting those wild gullies where the Wye rises; and what rattles down upon us here as merely a smart April shower will most probably up there be such a disheartening down-pour as made the mud-pudding in which the Prussian artillery struck on their way to Waterloo, when the Duke kept looking at his watch every moment, and it was so nearly all up with the hopes of the gallant long-pounded English army.

A week since the water had begun to "fine;" and one evening we went down to a famous salmon-run with full fresh paraphernalia, bent on doughty deeds; but, after an hour spent exposed to a sprightly breeze, we had to return home as darkness fell, without having been indulged with even a sight of a fish, but having caught a violent cold.

Oh! the tortures of that neuralgic night! It was impossible to get a single wink of sleep until I had plastered my temples with a mixture of powdered ginger and whiskey, having applied a strong dab of the same in brown paper to the nape of my neck. It is an excellent remedy, but the ginger must be keen: stale, it is of no use. As regards toothache, it is worth knowing that there are two sorts—the one dependent on cold, the other arising from acidity in a hollow tooth. This latter kind (the toothache of children) may be instantaneously cured by a filling-in of carbonate of soda. It is just as well first to cleanse the cavity, and dry it with a pinch of cotton-wool, as a dentist does in preparation for stopping with gold. You may readily know which sort of toothache the patient is suffering from, if you press the pulse tightly at the wrist. The pain being neuralgic, it will be momentarily arrested by the check to the blood's flow; whereas if it be local toothache, owing to the presence of acidity (late sweetmeats) in the hollow, this squeezing of the artery will not affect the sensation.

Reader, gentle reader, it being just after supper, I am lavish of pet recipes; and, having last time told you of the mysteries of that delicious compound, potatoes and buttermilk, to which we poor farmers, in these sad times, must fain so often have recourse, let me now give you a hint of another stunning amalgamation. Upon your plate lay a slice of rich cheese, which pare, and work up to melting mood with your knife, used medical-spatula-like, by help of about one-sixth part of butter. Then, taking the castors in hand, pour out and sprinkle on your product, of the contents of each bottle—vinegar, cayenne, black pepper, Worcester sauce, anchovy, oil, salt, mustard, catsup, and whatever else may offer. Beat up and mix well. And the result? Don't ask me, but try. Our teeth are watering already. Try it, my lads, if you never have done; and be thankful to him who has given you the receipt for "crab," or, as some term it, "all-around," from the simple mode in which the source of its excellence, the condimental reservoir, is used.

But we must really get out-of-doors. I shall be glad when the ash-bud bursts, and there is a good substantial bite upon the meadows again. I am thankful that we have an abundance of mangold left, and a good stock of hay—this latter not of the best, however. From a variety of causes, it was allowed to grow too old before it was mown.

It scarcely seems so, but it will soon be a year since a jolly young friend of ours saluted us as follows: "I'll tell you what it is, old fellow—if you don't cut this field soon, you'll just be making toothpicks for your stock, instead of fodder. It will be no better than straw." He was right in a good deal. If one pretends to make hay, let it be done properly, as all things should be done, in their turn and place. But as for his comparison to straw, I would it might prove no worse! Why, cut wheat-straw, mixed with pulped roots, and left to stand awhile, is as good provender as can be—super-excellent, in fact, if sprinkled with meal and a wholesome flavouring of salt.

Straw, indeed! Our youthful adviser can never have read old Drury's interesting volume, in which he shows how, if you steep chopped wheaten straw in cold water for some hours, it will form a jelly which, mixed with meal, is most nutritious. "Anything that makes a jelly is good," how often have I heard from the lips of a capital feeder! Don't abuse the straw, then; and what's more, save it a little more rigorously in your foldyard.

By the way, as regards this, let me give you a wrinkle which we accidentally obtained, but which may be deemed serviceable, having met with the decided approbation of more than one distinguished agriculturist who have lately done us the honour of inspecting our stock.

All around our cattle-yard we have an open shed; but, from shortness of material and hurry, we were enabled to put a manger along one side only. The consequence of this is that on three sides there is always a dry lair. The cattle get a habit of standing about and trampling near the manger, which soon reduces the bedding beside it, however often fresh-laid, to a wet mess; whereas in our yard, by this accidental arrangement, the straw upon three sides lasts clean and dry a week.

To return, however. It is certain enough that hay from which the seed has fallen is not nearly so nutritious as that on which it was saved half-ripe; witness the Australian plan of cutting and drying oats, for winter use, before the seed is full. *Apropos* of this, I remember, some years since, visiting the farm of one of our greatest and most intelligent living agriculturists. He took me, after other sights, to see a batch of six prize cart-mares, fat as butter, and frolicking about the fold. At the expression of my exceeding admiration he smiled, and took me to the corn-bin, wherein he showed me only grass-seed. Being a man of substance, and always wide-awake, he gets many a good bargain such as does not drop into the mouth of every passer-by.

Grass-seed will not vegetate, as a rule, the second year. A neighbouring speculator, having been unable to clear off his stock within the season, was glad to take what he could get for the surviving store, and that was, if I remember well, but a shilling the sack. On this the team fattened—whether profitably or not, you can calculate, my reader, for yourself.

The gardener is just beginning his noisy, clattering avocation upon the lawn; and, as I am in the humour for revealing pet recipes, let me tell you of another very useful one, originally discovered by a professor of chemistry at the university, who took pride in the improvement of the fellows' grass-plot. I need scarcely describe to you that industrious weed which so persistently disfigures our slopes, to the displacement of fine grasses—the plantain (its name how suggestive of delicious West Indian breakfasts! but its use, so far as I know, in this country, being confined to supplying canaries with a change of diet on its stem of seeds). Having watched for a hot day, cut off the crown, just under the surface, with a sharp, thin knife, and drop a taste of the tincture of iodine upon the bleeding root. The sun must shine upon the execution, or it will take no effect.

How delighted the children are now, every day, upon the advent of either a foal, a hatch of chickens, a calf, or late lamb! How they hop and skip about, and beg it may be theirs, at least in name! The only young thing they don't seem to affect is a litter of pigs; probably, although they don't confess it voluntarily, because they so often get dubbed themselves, by the nurse, with that appellation, when they bring themselves in from bird-nesting to dinner, all tattered and torn and bemired, as if they had been drawn through a ditch, "And everything quite clean-put-on, sir!" If they could but know the delights of their age, with no thought beyond the hour, a rainy day their sinking market, an empty plate their stunned exchequer, the morning lessons their bad investments—sorrows which glance off at pudding-time, as arrows from a polished casque! How delightful would it be, if we old people could sometimes, in a like degree, strip ourselves of the mouldy arras of our cares! It would be as a butterfly coming forth from the grub. It would be like taking one's aching brains out, and plunging them in spring-water, as one feels a longing to do sometimes—a process to be considered on a par with sitting in one's bones only, on a hot day, as Sidney Smith suggested.

Talking of aches, with one more medical hint I will conclude this paper. Several of our young ones, and the Missus herself, have been wise enough lately to get their fingers pinched in a closing door. I need not tell you how agonising the sensation is; but what I do tell you is, Rush immediately, open-mouthed, at the writhing sufferer, and hold its arm high up in the air. The pain will cease at once; for the blood is arrested in its flow by the artery being compressed against the bone (it runs under an arch), near the shoulder. Have hot water brought at once, into which dip the wounded hand; and keep the temperature as high as they can bear.

VIGIL.

THE MALT-TAX AND THE GROWERS OF BARLEY.

BY A PRACTICAL FARMER.

Extract from the *Mark Lane Express* of April 22nd. "Malt.—From a Parliamentary return, issued on Saturday, it appears that the number of bushels of malt charged with duty, and the amount of duty charged, in the year 1866, in England, Scotland, and Ireland, was as follows: England, number of bushels 47,263,665, amount charged £6,410,134 8s. 11½d.; Scotland, number of bushels 2,554,288, amount charged £345,182 19s. 3½d.; Ireland, number of bushels 2,463,269, amount charged £333,930 6s. 6½d.," making the total impost levied upon malt (barley) amount to the enormous sum of £7,089,247 14s. 9½d. Now this is a manifest wrong—a positive injustice to the cultivators of barley. Looking at the impost dispassionately, no one could imagine that any free, liberal, and enlightened Government could lay such an intolerable burthen of taxation upon this, a most important product of home-growth. Who can wonder that it should so greatly limit the growth of barley, and that too in a country which of all others in the world is best adapted to produce it in superlative quality and quantity? Wheat in astonishing quantity and of superior quality to British growth can be imported from many countries; but from no country can barley be imported equal in quality for brewing purposes to that of home-growth. This would point to its being the staple product of the three kingdoms, as indeed it ought to be. But look at the statistics of the number of acres under corn crops, as can be best ascertained by actual collection, *i.e.*, in Scotland and Ireland, and by reliable estimate in England. The totals are thus given: Wheat, number of acres 4,331,472; barley, number of acres 3,006,701; oats, number of acres 3,939,043; proving that barley from some one cause or other is not so widely cultivated as our other more popular cereals. The only proper solution of this anomaly is the unrighteous and most iniquitous operation of the Malt-tax. The average price of wheat since the Tithe Commutation Act was passed, or for the past 31 years, is 6s. 9¾d. per bushel, for barley 4s. 1d. per bushel; another manifest disproportion in price, owing no doubt to the same cause. Or to take them in weight, wheat will be found to average about 1s. 6d. per stone, and barley 1s. 2d. per stone, being a difference of fourpence per stone in price during the past 31 years. This I contend is a great disproportion in value, and it will more particularly appear in taking the view of the whole question I am about to take.

Some years ago, by order of the House of Commons, a series of scientific experiments were made, for the purpose of ascertaining the relative qualities of malt made from English and Scotch barleys, and so far as reliance could be placed upon the usual qualities of the different growths, and the accuracy of the process of malting, it was proved that a Winchester quarter of each grain when malted would produce the following quantities of proof spirits, viz., English barley about 21⅛ gallons, and Scotch barley about 19¼ gallons; and in other experiments with the best Norfolk and the best Scotch barleys the difference was found to be still greater; both being malted by the same person. This is excellent proof of the exceeding high value of English barleys for yielding proof spirits, and I presume to assert with great confidence, that such would be the proof from any other country, as foreign barleys are mostly of inferior quality. What an injustice is this, then, to the English growers! They last year had this tax laid upon no less than 47,263,665 bushels of their produce, the average tax amounting to about 2s. 10d. per bushel. The average price of barley at the same time being but 4s. 2¼d. per bushel.

Presuming then that English-grown barleys are of superior qualities for yielding proof spirit or for spirituous purposes, it would follow that if all restrictions to their conversion into malt were withdrawn or abolished the English grower would soon enjoy an enviable monopoly, his barleys being in such great demand for brewing and distillation. And so far as refers to brewing, the brewers would soon establish a very extensive and highly lucrative foreign trade in beer and ales. At present fine ales abroad are upon a par in price with many of their better class of wines. It is also a fact that these best ales are becoming very popular abroad, and it is mainly owing to their exorbitant price that so little way comparatively has been made in exportation, as not more than between 700,000 or 800,000 barrels are annually exported. Who can tell what beneficial results may arise from a free open trade in malt and beer? Who can tell the hurt, damage, and loss of trade and produce from a tax of nearly £7,000,000 sterling being laid in this little kingdom alone upon malt, from which is brewed one of the finest and most wholesome beverages of the age?

This must be removed. All restrictions must be taken away, in order to promote the growth of English barley, and that to the very utmost. Wheat and wheat flour can be obtained for the sustenance of the people from every quarter of the world in abundance. England can only grow English barley, and to this the energies and skill of the English farmer should now be directed. We want barleys of the best growth and quality to be grown, all fitted if possible for the brewing of the best pale ales, and our aim must be to improve them both in variety and in general management. Best barleys will thus command a very high price, and the better the quality and the larger the quantity obtained, the greater extension in the brewing of best ales will be the result, and the increase of trade and foreign exports will be in proportion. I look for an immense extension in the brewing and distilling business, if we can only get the hindrances removed and the trade thrown open, and chiefly because we produce barley to yield 10 per cent. more proof spirits than barleys from elsewhere. Our growers of barley will also increase proportionately. Barley will be the popular crop, and growers will vie with each other in the production of best qualities. Barley will be grown in many districts which are at present considered unsuitable for its culture. It is a well-known fact that barley will grow in any soil, and in any climate; but this is not the case with several other cereals. Therefore farmers need not hesitate as to its actual growth and ripening. The chief difficulty in unsuitable districts will be to produce the grain in commendable quality. And be it so that first-class qualities cannot be thus realised, there is every probability that useful sorts may be obtained, which will undoubtedly partake of the benefits to be derived from taking the place of first qualities. Many strong coarse barleys on being malted will yield exceedingly well in proof spirit; but the beer brewed is not of fine colour and brightness. This, however, is of no great importance to the general consumer—good strong beer suffices for him; nor would he care to pay much extra for colour. In a paper inserted some time ago, I suggested matters relative to cheap brewing and cheap ales, to which I refer my readers.

I will now say a word or two on improving our qualities of barley. The first thing should be the selection of a kind to suit the soil, and the condition of the soil where it is to be grown. Strong-growing long-strawed barley should never be sown on rich soil. There is almost a certainty of its becoming lodged at harvest day, aad consequent loss of quality. If the soil is actually poor or becomes out of condition, free-growing long-strawed varieties are the very kind for it, and *vice versâ* for a rich or highly cultivated soil. We have many varieties grown in the kingdom. It is by careful attention and judicious selection that difficulties in the production of best qualities may be overcome. I could name many varieties; but unless I knew intimately the character of the soil, or the precise condition of management it was in, it would be utter folly to recommend a sort. Every farmer must use his best judgment, his aim being to produce a full crop, but not too heavy—a good quality rather than a larger yield. The subject "the growth of barley" is a large one—I can only suggest a hint or two. Every good modern farmer is in the regular use of much valuable artificial food for his stock, and much artificial manure for his crops. In the customary four-course shift, this course is almost sure to injure the quality of his barley: query, had he better adopt the five-course shift, or in some cases take turnips, oats, wheat, seeds, barley? On fine rich loamy soils under like artificial aids, he might take turnips, oats, wheat, potatoes, wheat, barley; or turnips, oats, wheat, clover, potatoes, wheat, barley. On most of our thin soils the four-course shift cannot be readily excelled, but an occasional deviation may be beneficial. The great thing to be borne in mind being to produce the greatest number of good crops of barley. To this end I would suggest to landlords and land-agents the positive necessity of great relaxation in the courses of husbandry, in the rotation of crops, and in general management. I think every intelligent farmer, in the judicious employment of ample capital, ought to be permitted to farm without any restrictions whatever.

THE IRISH LAND QUESTION.

So far as we remember Mr. Caird's antecedents as a public man, these have been rather opposed than otherwise to the use of such a term as TENANT-RIGHT. Indeed, as "a Commissioner" he evinced all a Scotchman's partiality for a lease, and was ever inclined to emphasize such a system as the only commercial principle upon which land could be cultivated. It is satisfactory to see so close a commentator coming round to a reading, the good policy of which we have long maintained. In place of pitting the Lease and the Right one against the other, like a couple of game-cocks, it may be quite possible for both to exist in the same district, or even to flourish on the same farm. A lease, without compensation clauses to finish up with, would not so invariably result in established improvement, while the action of Tenant-right might be easily adopted where a variety of circumstances would raise difficulties as to the granting of a lease. Any one who says that the soil cannot continue up to the standard of proper production without the protection of a lease says simply that which is not the fact, as the best-farmed lands in this kingdom, where the greatest outlay is incurred and the greatest results obtained, are held, here, on yearly tenancy, and, there, for a term of years. Mr. Caird, in a letter which he has just published, would combine the benefits of the two practices, and in doing so he at once accepts the definition of Tenant-right as given before Mr. Pusey's committee—"The fixed capital should be found by the landlord, the floating capital by the tenant." Mr. Caird, however, acting as his own interpreter, takes this doctrine with him into a new country, and one where above all others it may be the more difficult to introduce, from the fact of something very different having long been recognized under the very same title as that he employs. To this day the student can scarcely explain what precisely the Irish Tenant Right does or does not mean; although if it aims at anything in particular, this is most probably fixity of tenure. By the Ulster custom the incomer pays the out-goer not merely for improvements, but for good-will; and in other districts, so long as the tenant pays his rent, it is understood that he cannot be put out of possession. The observance of either of these usages conduces, of course, to anything but advancement. The good-will, like the charges for acts of husbandry in parts of Kent and Surrey, locks up the new man's capital, which should be more actively employed, and the first step of an improving landlord would be to buy up such claims, and start the fresh tenant fair and square. Fixity of tenure, as maintained by an annual fine rather than a rent, is still more objectionable, as not only interfering with the rights of property, but tending in its very influence to a stand-still habit, if not even to retrogression. Here in England there have been, as a rule, few properties worse done by than those held under Colleges by the payment of a periodical fine, and where the occupier considers himself, and is for, all essential purposes, the owner.

Mr. Caird very wisely abandons such systems as these, as he draws a strong line of distinction between the duties of Irish landlords and Irish tenants. The buildings, the drainage, the fences, and the roads are in the outset the business of fixed capital, or, in other words, of the landlords. But then, unfortunately, the Irish landlords do not build and do not drain; for they either have not or will not employ their capital in this way; and the tenantry are much in the same predicament as to the want of, or the willingness to, lay out their money. In this difficulty Mr. Caird proposes to introduce a Tenant Right Bill, under the provisions of which "Government should be authorized to advance money to landowners for the execution of such specific permanent improvements on the land as should be sanctioned by competent Government officers, on the condition that, by a voluntary agreement betwixt them, the landlord should for thirty-four years secure the tenant in the possession of his farm, provided he regularly paid, in addition to his rent, the annual sum of 5 per cent. in repayment of the principal and interest of the Government loan. The tenant would then be certain of his farm for a period long enough to repay him for his exertions, his own capital would be rendered doubly profitable by the buildings, drainage, and other permanent improvements, the annual cost of which to him would not be more than a very moderate rise of rent." With the predisposition engendered by habit and education, we approach here again very closely upon fixity of tenure, if indeed, with a mind already so trained in this direction, Mr. Caird's plan does not go very far to confirm such an understanding. A man who knows that he can hold on for thirty years or more, and knows farther that his landlord did not find the money for his improvements, but that he himself is virtually responsible for this, will, with all his national prejudices strong upon him, be hardly put in the right way to render up peaceable possession. It must, however, be specially remembered for whom Mr. Caird, on his own showing, is legislating —not for the man of means, with the best breeds of stock in his boxes, the newest implements in his sheddings, and all the latest discoveries in science and practice at his command. Mr. Caird, on the contrary, goes actually by preference for the cottier tenantry of some twenty or thirty acres each holding, as the class of all others to profit by his Government grant, and to make the most of new buildings, better drainage, fresh roads and fences, as to establish the agriculture of Ireland upon a proper basis, after being left to themselves for thirty years to do so. Mr. Caird speaks in glowing terms of the changed aspect of the estate, the increased security for regular payments, and so on. But is there any warranty for this pleasing picture? Does the experience of any country point to advancement achieved by such an agency? It may sound somewhat hard to say so; but as a rule it is the small farmer, of all others, that does not improve. In plain truth, he cannot afford to do so. Small tenure of itself implies small capital, actually, and comparatively with that invested in larger holdings. The cottier tenant is in very virtue of his position a needy man—in intelligence and education scarcely superior to the common labourer, as providing the labour of his farm from his own family. Mr. Caird does not think the large-farm system suited to the climate of Ireland, although it is not so clear how he has arrived at this conclusion; and for our own part we should make it rather a question of usage than climate. But, allowing him to be right here, assuming that it would be more palatable to the people to let the twenty or thirty acres holdings continue, we doubt very much how far Government would be justified in lending money on the promise of such security as is here implied. If so far fixity of tenure in Ireland has not conduced to improvement, if it is politic to remove such an impression from the minds of the peasant farmers, then it surely cannot be advisable to grant these very men some thirty or forty years' possession on the understanding that this of itself will be the great inducement for their advancement. We would wish here to be understood as speaking not so much of the Irish as of small occupiers generally, when we say that such a class, above all others, require some immediate control and some continual supervision. It is very questionable whether any man, however large his means or great his abilities, should have the estate of another almost unreservedly handed over to him for so long a period as thirty-four years; as it certainly does not seem politic that so unprecedented a power should be tried in the first instance on those whose acquirements scarcely justify the experiment.

TO THE EDITOR OF THE TIMES.

Sir,—I beg the favour of your insertion of some remarks on the Irish land question, with a suggestion for a plan of voluntary action between landlord and tenant, which perhaps may not be without use in the consideration of the Bills which stand for an early discussion in Parliament. Allow me first to touch one or two points on which I think exaggerated opinions are held by some men of weight and authority. All may admit that Ireland was over-peopled in 1846, immediately after the potato famine. Since that time, however, more than a third of the people have disappeared. Yet it is said, on high authority, that it will be necessary that she should lose one and a-half million more before she can become fairly prosperous. Let us hope this may not be so, for at this moment Ireland, for her extent of corn land, is not more populous than Holland or Switzerland, both countries from which there is little emigration, and both, like her, more pastoral than either arable or manufacturing. Then it is said Ireland is, from the humidity of her climate, not at all fitted for the production of corn. But she does produce more than two million acres of corn annually, of the value of 12 to 15 millions sterling. That she is still, in by far the largest degree of any country in Europe, dependent on the potato for her food, is much to be deplored.

The small-farm system is condemned by some, and that of the

Lothians and the corn counties of England commended as a substitute. Independent of other considerations, I don't think the large-farm system suited to the moist climate of Ireland. I am sure it will not usefully maintain so large a population, and statesmen ought not to overlook the fact that of a capital of £31,000,000, invested in live stock, in Ireland, more than one-third is the property of tenants holding less than 30 acres of land.

Then, it is said, Ireland has neither minerals nor manufactures to give employment to her surplus population. In that respect she is in no worse position than the south of England and the north of Scotland. It is as easy to move labour to Lancashire and Yorkshire from the remotest part of Ireland as from Devon or Caithness. But inasmuch as nine-tenths of the Irish emigration passes through Liverpool, crosses the Atlantic, and most of it then presses on 1,000 miles into the interior towards the rich valley of the Mississippi, it would seem that an agricultural population finds little attraction in the high wages of the manufacturing districts so long as there is the prospect of the more congenial agricultural employment in which the people have been bred. Now, I do not question the advantage of that emigration to the individual. What I feel is, that the nation is being weakened by the withdrawal, year after year, of so many thousands of the young, strong, and intelligent. It is no longer a question solely of landlord and tenant, for this constant drain is a national loss.

We may assume that landlords and tenants in Ireland are governed by the same motives as regulate the actions of the same classes in other countries, and that both desire the improvement of their condition—the owner in the permanent advance of his property, and the tenant in the secure enjoyment of his capital and industry. Since it is only from an increase of wealth that the fund can be created from which wages are paid, it is an error to imagine that emigration will make Irish landlords or farmers richer, if unaccompanied by an increased productiveness of the land. On the contrary, the probability is that both will become poorer—the landlord through diminished competition for his land, the farmer by the scarcity and higher cost of labour. But increase the productive qualities of the land; and the farmer's profits increase, the landlord's rents improve, and the foundation is laid for the profitable employment of labour.

Two things are wanted for profitable farming—fixed capital in buildings, drainage, fences, and roads; and security of tenure for the floating capital of the farmer. The fixed capital should be found by the landlord, the floating capital by the tenant. One of the witnesses before the last Committee on Irish Tenant Right, a high authority on the subject—Mr. M'Carthy Downing—told us that he was not aware of any single case of any landlord in Ireland building a house for a tenant, "if you mean building it from the foundation, paying for it, and putting the roof on." The fact is notorious that in Ireland the landlords, as a class, either cannot or will not find this fixed capital, while the tenants have no security to induce them to do so, even if they could spare it (which very few could) out of the fund they possess to stock and cultivate the land. I propose to remedy this by finding the fixed capital for the landlord, on condition that he gives the security of a lease to the tenant for the period necessary to repay the loan.

At the present price of Consols, Government could borrow money at $3\frac{1}{4}$ per cent., which would repay itself, principal and interest, in $33\frac{1}{2}$ years. As the operation of a loan of this kind would be gradual—certainly not over a million yearly—it would cause no pressure on the money market.

My idea of a Tenant Right Bill would be that Government should be authorised to advance money to landowners for the execution of such specific permanent improvements on the land as should be sanctioned by competent Government officers, on the condition that, by a voluntary agreement betwixt them, the landlord should for 34 years secure the tenant in the possession of his farm, provided he regularly paid, in addition to his rent, the annual sum of 5 per cent. in repayment of the principal and interest of the Government loan. The tenant would then be certain of his farm for a period long enough to repay him for his exertions, his own capital would be rendered doubly profitable by the buildings, drainage, and other permanent improvements, the annual cost of which to him would not be more than a very moderate rise of rent. The landlord would be relieved of the necessity of making an outlay of money, while he would have increased security for the regular payment of his rent, and in that, and the changed aspect of his estate, would be amply compensated for parting with its control for so lengthened a term. The State which found the money would not only receive it all again, but would benefit by the settlement of a difficult question, resulting in harmonious action between landlord and tenant, and gradually increasing and remunerative employment to tradesmen and labourers.

I do not see any reasonable objection to such a measure as this. It may be tested by considering how it would work in England and Scotland, for a Landlord and Tenant Bill which is sound in principle should be applicable to any portion of the United Kingdom in which the necessity for it may be felt. I ask myself, as a landowner, whether I would accept the aid of the Government on the condition of parting with the control of my land for 34 years? In Great Britain very few landlords would, but that is because they have already invested in their land the larger portion of the fixed capital which is required for its profitable occupation. In that case such an arrangement is not needed, and therefore *cadit questio*. But where it is needed, and where the landlord cannot or will not find the capital, then in any of the three kingdoms this principle would be just and reasonable, and beneficial to all concerned.

There is nothing in it which interferes with the voluntary action of landlord or tenant. Its operation would be gradual, for 20 years have been requisite in Great Britain for the voluntary expenditure of ten millions sterling on similar land improvements. It would give an immediate stimulus to employment among agricultural labourers, country tradesmen, and artisans; and Parliament might leave such a measure quietly to work its way in the confidence that a principle had been set in motion which would gradually, but surely, change the face of the country, and put an end to the existing evils in Ireland caused by the inability of limited owners to expend the requisite capital on the improvement of their property.

I am, sir, your obedient servant,

JAMES CAIRD.

THE STRUCTURE OF HOP-OASTS.

MAIDSTONE FARMERS' CLUB.

At a recent meeting of the Maidstone Farmers' Club, Mr. J. H. Hodsoll in the chair, the discussion was the "Construction of Oast-houses," the subject being introduced by Mr. **STONHAM**, who, illustrating his remarks by a very neatly constructed model of an oast-house, said: It was observed once by a French author, when questioned about originality that few men are original; that there are few things that are new; and he made a comparison thus: "I present you with a bouquet; there is nothing of mine, only the thread that binds it." It is about the same with the model that I show to you this evening. It is a collection of the best principles of others, collected together into one system. You will see in the first instance that I am indebted to Mr. Plomley for the idea of a flue; for there is Plomley's principle centrally applied, and thereby, I believe, made more effective, and without the liability of setting the building on fire. Then, you see, I have the brick dome to the kiln—a plan that has been in use in Sussex for a number of years. Again, I have the old debatable open fire baskets, that have so often been thrown aside and so often reinstated. With so little new or striking in my model, I should feel great diffidence in occupying the time of the club did I not feel a very strong impression that hop-drying and the construction of oast-houses are not so well understood as they might be (Hear, hear). But knowing that many of the members present are quite as conversant with the subject as myself, and knowing also that there is a gentleman present who wishes to address the meeting after me, if time will permit, I shall content myself with making one or two observations, and then give a general description of the building and its capabilities, preferring to communicate anything more that may be necessary in an interrogative form. The first subject I shall touch upon is—Is it essential that hop-kilns should be circular? To which I decidedly say yes (Hear, hear). Time was, no doubt, when we really believed that the wind blew where it listed; and it was just possible that some of us may have had a dreamy notion of old Æolus with his wind-bags spitefully sending his blasts in direct lines at some place or object. But scientific investigation has dispelled such illusions, and we now know that storms are engendered by heat in the tropics, that the winds do not go where they list, but that they move in circles, and are governed in their movements by general laws. Now I apprehend that lighting a fire any where is to a certain extent creating a storm; and since we know that air moves in circles, and when it is rarefied its ascent is spiral, I think it would be most unwise to oppose angles to it. Therefore I say, unless under peculiar and special circumstances—I am not going to say that hop-kilns of other shapes will not dry hops, and do very creditable work—other kilns ought to be the exception and by no means the rule. (Hear, hear). The next subject is the injury often done to the hops by employing too much heat in the first stage of drying. Now it is just possible that some gentleman present may say, "That is so well known that it is scarcely worth alluding to;" but there is a particular cause why the heat acts so injuriously in the first instance, and that is because the opposition to the ascension of the heated air is so great in the first stage that it cannot pass through with any considerable amount of rapidity. The effect upon your hops is something like a jack standing still before the fire; and I think we cannot too often impress this upon the minds of our driers, and if we can carry their minds with us, and get them to realise "the reason why" they will be much more likely to carry out our orders in an effectual manner. (Hear, hear). In 1858 my brother and myself were in partnership. We had but a few acres of hops, but being anxious to know the ins-and-outs of hop drying we ordered some thermometers, and determined to make a careful record. Three thermometers were used, one under the hops, one erect in the hops, and one suspended above the hops, just clearing the surface. Observations were taken every hour. In recording our figures we noticed a great many interesting facts about hop drying. We found that in the first stage of drying, the air was from 40 to 50 degrees hotter below than above the hops; and in the last stage, when the resistance was lessened by 75 per cent. (a bushel of green hops when green weighing 6lbs., and when dry but one pound and a half—green being four times the weight of dried hops, and therefore four times the obstruction to the ascension of heated air) and you get nearly an equilibrium, there was not above 10 or 15 degrees difference. I think that that shows beyond any dispute the rapidity with which air passes on the resistance being lessened; and I believe we want to impress this upon the minds of our men, and thoroughly explain it to them so that they may know how to act, without you believe, like the engine-driver in "Mugby Junction," that "it won't do for them to know too much." I will now proceed to give you a general description of the building. It would cost at the present time about £200 for everything complete. It is an eighteen-feet kiln with a brick dome. Around the bottom is a ditch to screen the air-holes, which I will refer to again presently. The capabilities of the kiln are to dry one bushel per square foot, the mean temperature of the hops being 130 degrees, in twelve hours, and it is about equal to the requirements of eight acres of hops. We estimated that there were 6,000 hop-planters at the time we constructed this oast-house. Eight acres to each planter is the average. Our highest averages give about 15 cwt. per acre, or six tons to each planter, and allowing 1,500 bushels of green hops to the ton, or 900 for 6 tons to be dried in three weeks, which is the time these days of bright beer seem to indicate for curing, we supposed that this kind of building would be a requirement. To those whose acreage is above the average, duplication of the building would meet the case, which could be done at a proportionately less cost. In case of duplication or re-duplication, I would strongly advise that the kilns should be isolated; as you would find that two kilns together would not dry so well as one by itself, and you cannot have too free circulation of the air. I do not say that these works will not dry more than one bushel per foot in twelve hours; I have dried $1\frac{1}{4}$ bushels in six hours, by increasing the temperature, and made good showy work; but I cannot recommend such a course. I, however, feel so convinced of the releasing effect which temperatures over 130 degrees have on the essential volatile principles of the hop that I would advise never to get beyond that temperature. I am not going to pin my faith to 130 degrees of heat. I am satisfied that 100 is very much better; but as the plan is not recognised in the Borough, it does not pay us to use it. (Hear, hear). I know a gentleman who tried it one year, and he found the plan most expensive. It requires twice the time or space to dry at 100 degrees that it does at 132, and if we cannot get an equivalent in the shape of price, I think it is no use our going to an additional expense. (Hear, hear). Now I am on the subject of temperature, I will just give you a peculiar illustration of the releasing effects that heat has on the volatile principle of the hop. I have here two samples of Golden Grape hops. One was not heated more than 150 degrees at any time during the drying: the other is a branch of hops which has never been subjected to a greater heat than 50 degrees, in fact has been hanging up in my sitting room. As we all know, the great test of the merchant in the factor's office, after he has looked to see if the sample be presentable and has been nicely prepared, is to fetch out the virtue of the hop by friction. Now if you take up the sample prepared in the ordinary way and smell it you will not know it is a hop; but if you take what you at first sight would think a worthless thing you will find that it has a marked difference, and I think I may venture to assert that there is at least 30 per cent. more "brew" in those hops which have never been subjected to a high temperature, than there is in those which have.

The CHAIRMAN: The difference is certainly very marked.

Mr. PAINE: But there are circumstances which account for it. One has not been subjected to the brimstone and the fire.

Mr. STONHAM: We try all we can to hermetically seal our hops to keep their virtue in. But there is a sample, which has been exposed to the air, possessing more aroma than those which have been treated in the ordinary way. I have a register here of the drying for the season of 1858. Three thermometers were used as before. One under the hops, one in the hops, and one just above the surface; and observations were registered every hour. The mean register of the kiln—a sample from which took a prize at a local club—was as follows: One bushel per foot of grape hops; shower of rain while picking; on drying 13 hours.

	Under hair.	In hops.	Upper Surface.
Mean.........	138	124	94

It will be seen that I recommend a brick dome to the kiln. This is valuable in more respects than economy and durability. In case of fire from lucifer matches being dropped in the hops and igniting on the drying floor—cases which are becoming very frequent—the dryer has only to nail a hop poke over the door, and keep it damp, and the fire will burn out without extending to the other parts of the building. With regard to the flue in the centre of the building, I tried two years without a flue, but with a flue the result is a freer sale at more money, in consequence of greater uniformity and brightness, resulting from the freer circulation induced by the action of the flue. I believe that this appliance may be supported strictly on scientific principles, as accelerating the draught through the hops. However, it need not be used to the exclusion of any other apparatus; the entirety of the building will not be destroyed by its removal, and a building without it would not cost so much by a few pounds. It will be seen by the model that our air holes are screened by a ditch. I have found by repeated experiments that when the air flows in all round the kiln by its own gravity the temperature is uniform under the hair, which will not be the case if the air be allowed to be forced in by violent currents. In conclusion, I may say that I should be very sorry, with such a high opinion as I have of this building according to our lights at present, to write the word "finality" upon it. I believe that hop-drying is almost in its infancy; I believe that presently the mighty agency of steam will be brought into use for the purpose, and that air may be engendered in a building like what is done in the dock-yard at Chatham, and instead of our hops seeing the fire, we shall be able to turn a tap and allow heated air to rush through them and dry them. Having now disposed of the matter of oast-houses I should like to claim your attention for five minutes while I refer to another matter. I have here a drawing of a hop-picker's hut which I have just had constructed. It can be used at other times as a shed for feeding lambs, as a shepherd's hut, as an implement lodge, or as a fruit lodge. I think it would be very useful on a farm of my kind. Its length is 14ft. 8 in., and its width 12ft. 8 in. Its cost would be £15 10s. In conclusion, I have only to thank the members of the club for the very polite attention which they have given me.

The CHAIRMAN: You have not told us how many fires you used in your oast-house.

Mr. STONHAM: Two open fire baskets on each side.

The CHAIRMAN: The principle of the shaft for conveying warm air through the hops is worthy of great consideration. With regard to the circular form of oast-house, I have adopted it myself, and have built some for the very reason Mr. Stonham has detailed to you. I thought the circular principle allowed more easily an escape of the reek, and secondly I thought oast-houses on this principle were safer should there be an accident by fire. Mr. Stonham has taken great pains to illustrate his principle, and the details of his careful management must have proved very interesting. With regard to the fireplaces around the circle, my impression is that with sufficient heat it matters little whether you have the fire in the centre, or whether you have it at the front of the circle. I have altered the position of the fires in most of my circular kilns by bringing them from the centre to the front of the circles, and at the same time by closing the small air-holes around the base of the circles all air from without passes either through or over the fires in its passage to the hair on which the hops are dried. The outside current of air mixing with the heated air in the kiln does I think retard the drying of the hops, and operates so as to make the sample "hayed" and does a great deal to destroy the fragrance of the samples. Since I have made the alteration the observation has been made in the Borough by more factors than one, that the samples had improved. With regard to the plans for a hopper's hut, any gentleman who is an occupying tenant will do well to take a memorandum of the price. Finding last year that I had not sufficient room, although I have a great many hopper houses, I bought 10 of the Crimean tents. They cost me £25 each, and they were very much approved by many of the people who came down to pick hops, and provided the weather had been more congenial, instead of being so damp and wet, I think that they would have preferred them to any close hopper-house. The plan of Mr. Stonham, however, appears to possess many advantages, being cheap, light of construction, offering free circulation to fresh air, and being available for many other purposes.

The Rev. J. Y. STRATTON: The Association for the Improvement of hop-pickers will I am sure be very glad to receive an estimate from Mr. Stonham of the cost of the building of which he has a model here, not only in wood but also in corrugated iron. The association propose to issue lithographed plans of the building best fitted for the purpose, and, if attention is drawn to the matter in this way, I think it will have a very good effect. With regard to the tents mentioned, it should be remembered that great care is taken in the army that they should be waterproof above and below, and that they are not inconveniently crowded. If this is carried out, I think there can be no objection to them.

Mr. J. PAINE drew attention to the fact that they were getting rather wide of the matter under consideration—that of the construction of oast-houses. (Hear, hear.)

Mr. BARLING having been loudly called for, that gentleman said, in rising to address the club on the subject brought before them by Mr. Stonham, he could not claim the advantage of that gentleman as a practical hop-dryer, but he would cheerfully afford them the result of his observation and thought on the subject; and he hoped Mr. Stonham would bear with him in his remarking that he was somewhat disappointed in his not having brought before the club any definite peculiarity or principle on the adoption of which the claim for economy and efficiency of his kilns was based. In fact it did not appear to him that Mr. Stonham had given all the attention to principle that the importance of the subject merited. It was Mr. Barling's conviction that till the true principles upon which drying was carried on were understood, no very great advance could take place in the construction of hop kilns. The laws that govern evaporation were strictly applicable to the subject under discussion. Evaporation went on under conditions of temperature and pressure very various indeed. Evaporation would go on at a temperature below the freezing point, and the rate or time in which a given quantity of moisture would be evaporated or dried off, was governed—all other circumstances being alike—by the amount of heat brought to act upon the moisture, and it had been found and might be relied on as a truth, that an increase of temperature representing about 20 derees of Fahrenheit's scale thermometer just doubled the speed with which moisture would be removed from any substance to be dried; that is, at a temperature of 60 degrees twice as much moisture would be removed in a given time, as would be removed if the temperature was only 40 degrees, and twice as much at 80 as at 60, and so on for every 20 additional degrees for a range of thermometer above that applied to the drying of hops. As related to the form of the oast, he did not think in practice it made any difference whether the building was round or square; for, when the hops were on the hair, they offered so complete a check to the motion of the heated air under them that it dispersed and spread very equally, and he believed if four thermometers were applied to the angles of a square kiln just under the floor, that they would not be found to vary more than the same number of thermometers equally placed under a floor of a round kiln. He considered that a proper proportion of ingress space for the air under the hops, and egress space for the vapour to be discharged from the cowl, should be given; and he could name some very fine oast-houses which had produced very faulty work, even with a very experienced dryer, from the non-observance of this particular. They are round kilns with lofty rafters. With good arrangement of fires and air below the hops, the egress space through the cowl was very disproportionate; it was much too small, and the removal of two or three rows of tiles round the cowl, enlarging the egress space, completely altered the quality of the drying. He would observe that, however the kiln was constructed, they would find variations in the work done, so long as they were dependent wholly on the atmosphere unaided by mechanical appliances. There were days when the air was so calm, or so charged with moisture, that while they were dependent solely on it as a power of drying, uniformity of result could not be obtained. He believed that the discussion might be beneficial in inducing thought and the application of true principles in the construction of hop kilns.

Mr. STONHAM, in reply, said he had intended to have observed that the apertures for the admission of the air to the kiln were equal to 16 square feet, and the opening at the top was eight square feet. He had been puzzling himself to work out some law whereby it might be illustrated what proportion the egress ought to bear to the ingress. But he was free to confess that it surpassed his power to get at it. He could only say that the principle of eight feet to sixteen worked well, and he strongly recommended it. As regarded the forcing of the atmosphere, Mr. Barling had only stated in a clearer manner what he had merely shadowed forth, when he spoke of the air forcing itself in by its own gravity. He had puzzled himself very much about the rapidity with which heat moved at certain temperatures, but he could only arrive at the conclusion that double the area was required for the admission of air to that which was required for its exit.

The CHAIRMAN said the remarks of Mr. Barling with regard to getting off the vapour were very useful. That was a most essential thing. Since he had constructed his kilns several gentlemen had inspected them. Last year Mr. Gunner of Alton, where the celebrated ale was brewed, called upon him, and he stated that in his district the fires were placed at a depth of from 6 to 8 feet below the surface, thereby getting greater pressure of air; and that, so far as cowls and kilns were concerned, they knew nothing of them. Their plan was to build an oast-house as they would a row of cottages; but, instead of roofing it in, they left it like a railway station, open at the ends, so that the vapour might evaporate there. He said they were much less expensive than oast-houses, and if they chose they could at any time convert them into cottages.

and strongly recommended him, if he required a new oast-house, to build one on that plan, and he should certainly try it, as it was so simple and inexpensive.

Mr. **Bridgland**, sen., asked a question as to the continental system of drying; and

The **Chairman**, in reply, said that the hops were first dried in the open air, and they were then collected by the Jews and taken to the towns, where they were finished by artificial means.

The Rev. J. Y. **Stratton** suggested that, as the Board of Trade were collecting returns of the acreage of hops, an expression of opinion should be given by the club as to whether it was advisable to make those returns complete by including all hop-grounds under five acres. (Hear, hear.)

ON THE REARING AND FEEDING OF LIVE STOCK.

At the last monthly meeting of the Ballineen Farmers' Club, Mr. **Hooper**, of Droomkeen, read the following paper:

In discussing the rearing and feeding of live stock, I will begin with the bovine or ox tribe, as being, perhaps, the most important to the farmers of this neighbourhood, and commonly distinguished from sheep, pigs, and horses by the term cattle. Our first consideration, then, shall be the rearing of the calf. The calf being dropped, this is to be borne in mind—that from that moment until it arrives at maturity it must be kept progressing, improving, growing; in no other way will it pay. The question is, how is this best to be done? Now, of course, the best food for a calf is that provided by nature—the pure, sweet milk of the cow; but dairymen and dairy-farmers have proved by experience that an ordinary calf will not pay for new milk, or, at least, that the consumers of milk and butter in our towns will pay a better price for it; and we also find by experience that a calf will grow and be healthy on milk from which all the cream has been taken; and, in my opinion, no better plan can be adopted to rear calves profitably than to give them plenty of thick milk (a thing almost unknown in England, I believe, but decidedly better food for calves than skimmed milk which has not turned thick and sour); but this feeding should be continued longer than is usual, say for at least five months. The calf should not be allowed to run out too young. I am convinced that a great many of the calves belonging to some of the smaller farmers of my neighbourhood receive a check from which they never recover by being exposed to the cold and wet before they are able to bear it. The calf should be kept in a loose box, with plenty of light and air, and a little fresh hay given him now and then, which he will soon learn to eat; then, at six or eight weeks old, he may be let out for a short time on a fine day, and the time increased by degrees as the weather permits. I believe some good authorities object to giving young calves hay, thinking it too binding for them; but I suppose this must be when the calves are reared on new milk; for I have always found the calves that eat most hay to be the healthiest and do the best. When there is abundance of milk the calves may be reared at very little cost, but they may also be reared very profitably even where there is a scarcity of milk. A Mr. Rush, in Gloucestershire (as I see from a report of the Cirencester Farmers' Club), rears from fifty to fifty-five calves annually, and he only keeps four cows. This he does by using hay-tea, with the addition of a little oilcake mixed with gruel; his calves cost him 1s. 6d. or 1s. 9d. a week each. I am myself rearing some calves now with very little milk by the help of hay-tea and oilcake, and I find that they cost me almost the same. The hay-tea is made either by boiling some hay, or putting some in a tub and pouring boiling water on it: the former plan is the best. We allow each calf four pints of skimmed milk at a meal, and add enough hay-tea to make the quantity up to eight or ten pints, according to the size and appetite of the calf; into this we put a little oilcake, which has been previously made into a paste with hot water, in the proportion of 2lbs. of cake to five calves; and they are doing very well. I may here mention what appears to me to be a great advantage in rearing calves at this time of year: all the time they are living on milk and the little bite of hay before mentioned there is no grass; but when the grass comes in the months of April and May, they are ready to eat it; and the difference between them and the summer calves the following winter is remarkable. The latter never overtake them, and we would scarcely think they were calves of the same year. I think at the present price of stock any good calf, dropped from November to May, should be reared.

There is not a ready market in these parts for the prime veal that fetches so high a price in London and Dublin; but a paper on feeding cattle would not be complete without some mention of the fattening of calves. I have occasionally fattened an early calf, and they have paid me very well for the new milk they drank; but I have found that I was quite at the mercy of the buyer, and always felt in taking a fat calf to Cork that I was running the risk of having almost to give him away. I may here mention that to fatten a calf most profitably he should be dropped not later than January, as the price of veal becomes much lower after March. As regards the mode of feeding for veal, I cannot do better than to quote the account given by a Mr. Dowdall at the Ballymahon Farmers' Club, in the county Westmeath. He lets the calf suck the cow morning and evening, and gives it a midday meal from the pail, which after a while has an egg beaten up with the milk. At a month old he sops white bread in the milk, and at eight weeks old he has a well-finished calf worth £6. I feed mine three times a day from the pail, but I consider Mr. Dowdall's a better plan, and were I fattening another I should adopt it.

We now come to the weaning of the calf. I find my calves do best on a clover stubble; that is, on the stubble of a barley or oat field that is laid out with clover and grass seeds; and I do not find that such light stock do any harm to the young clovers, provided they are not kept on them longer than the 1st of January. On whatever kind of pasture they are weaned, however, the milk should not be taken from them too suddenly; they should get a meal of milk in the middle of the day for a week or ten days after being turned out to grass, and the quantity of this should be diminished by degrees. When the nights begin to get cold, generally some time in the month of October, they should be housed at night; but, in my opinion, should be allowed out by day the whole winter, and therefore should not be kept in too close or warm a house by night. I have kept them in close houses, and only let them out for a few hours on fine days; and I have kept them in altogether, day and night, the whole winter, some tied and some in loose boxes; but I find them thrive and grow best on the system I have adopted for the last three or four years, and that is to tie them up at night in a shed open to the south, and let them out the whole day in all weathers, excepting, of course, when the ground is covered with snow, and they could get nothing to eat. If they could be put into a yard at night, with sheds around it, perhaps it would be better still, as some have an objection to tying up young calves; but if it has its disadvantages, it has also its advantage, one of which is, that they are much quieter when tied up the next winter, at which age I fatten off my young stock; whereas I find those I buy take some time to get accustomed to the chain and trough, and lose time accordingly. As to the feeding of calves, the first winter I find they do better, with the outrun I have spoken of, on hay alone, than on hay or straw, and turnips. Some may think this unreasonable, but I can only say that I have wintered calves for eight years *with* turnips and for four years *without* them, and I have no intention of altering my present system. Mr. Burke, whom I quoted before, who rears calves with so little milk, winters them on pulped mangels, mixed with straw chaff, oilcake, and crushed corn, and he says, reckoning 5 cwt. of straw chaff at 5s.; 10 cwt. of pulped mangel at 5s.; 1 cwt. of oilcake at 10s., and 4 cwt. of mixed crushed corn at 30s., he has one ton of food for 50s. equal to the best hay. But as our hay is seldom worth even as much as this in our own yards, I do not think we should gain much here by the adoption of his system, which is certainly though a great improvement on the ordinary one of whole or sliced turnips and hay or straw. I make no difference in the wintering calves intended for beef and those intended for the dairy—no matter what a calf is intended for, he should be well fed the first winter, or he will receive a check from which he will never recover. To proceed with my own system. I give my yearlings the best grass I have all the summer, and fatten them off the following winter; selling them when twenty-four, twenty-five, and twenty-six months old. I give them oilcake to the amount of 30s. a head (beginning with 1lb. a day, and increasing gradually to 3lbs.), and hay or straw and turnips *ad libitum*; and the best fetch from £18 to £20 a head, and the smaller ones from £15 to £16—that is, at the present and recent high price of beef. My cattle get three feeds of sliced turnips in the day, the first between five and six, the next at eleven (immediately before which they get their oilcake), and the third and last at five, or later as the days get longer. At each of the meals if any animals has finished before the others, or show any desire for more, more is given till they are satisfied. The cleaning out of the stall and currying of the cattle keep them disturbed a good part of the time between the first two meals; but after the second meal they are left to rest till the third, and after that are left undisturbed for the night. The racks placed above the turnips are filled with hay or straw as often as may be required. At whatever age cattle are put into the stall, they should have some turnips given them on the grass for a week or two before they are put in, to accustom them to the change of food. The heifers that appear best adapted for the dairy I sell as springers in October and November, when two-and-a-half years old. In my opinion this is young enough for even the largest and best heifers to calve; and smaller and weaker ones should not calve till they are nearly or fully three years old, according to their size and strength.

With regard to the feeding of dairy cows, everyone knows that the better you feed them the better they will pay, and I am sure they would pay for a little linseed or rapecake, in addition to the best food the farm affords. I "let" my dairy cows, and have not had any in my own hands for some years; but I am keeping a few now, chiefly for the purpose of rearing calves, which have of late years increased so much in value, and I mean to try 2lbs. of rapecake daily to each cow. The cost of this will be about twopence, and I feel sure the cow will give an increase of 1lb. of butter per week, besides being kept in a healthy state, and the rest of her food doing her more good. For I find that cattle getting oilcake not only improve in condition faster, but their general health is better, and a change of food does not affect them as it does those not getting it. Many have used oilcake and other artificial foods extravagantly, and that has set many farmers against their use altogether; but I believe, used with caution, and as auxiliaries to other feeding, they will repay the outlay.

But to resume: As I said before, everyone knows that the better a milch cow is fed the better she will pay, and there is little fear but that her owner will give her plenty to eat, if he can, as long as she gives him milk and butter; but some are apt to shorten the supplies of food during the time the cow is necessarily dry before calving. This is a great mistake, and tells against the owner in many ways—it weakens the cow at a time when she requires extra strength. This has such an injurious effect on her constitution that it lessens her supply of milk for the ensuing season, and above all it injures the calf. There is no surer way of having strong, healthy calves than to feed your cows well when they are dry.

I will now pass to the consideration of sheep; and, as I have just remarked with regard to the feeding of the cow, so I will say the only way to ensure strong, healthy lambs is to feed your ewes well up to lambing time. I have found nothing so good for ewes during the winter as hay given in racks on the pasture. If the pastures are very bare, and a sufficient quantity of hay cannot be spared, a few turnips will be necessary; but I do not like them for ewes if it can be helped, and, if they must be given, would prefer Aberdeens to Swedish turnip. After lambing, unless a better pasture can be provided for them, they should get an increased supply of hay and a few mangels (not too many), and in any case half-a-pound of oats each every morning. I believe no man ever took his oats to a better market than to give them to a flock of ewes with a good crop of lambs for a month or six weeks after lambing, according to the season and the growth of grass. The whole cost is nearly repaid in preventing the ewe from shedding her wool, as so many are apt to do after lambing, especially those that have twins; and the effect on the lambs is simply incredible, except to those who have tried it. If circumstances permit, those sheep that have twins should be kept separate from the rest of the flock, and have better keep; by this means you will have a more even lot of lambs at weaning time. The middle of February is early enough for the first lambs to be dropped; and a Mr. Davidson, in an address delivered at the Athy Farmers' Club (a most valuable paper, by the way, on the management of sheep) says he does not like to begin lambing before March, and that any lambs dropped before April 20th are soon enough, and often beat the March lambs. At whatever time they are dropped, however, this is certain, that a late lamb that has received no check is much better than an early lamb that has been stunted.

Supposing the lambs, then, to have been dropped through the month of March, they will be ready to wean during the month of July. For this purpose neither young grass nor clover nor old pasture is suitable—either would scour them; but a field two or three years in grass that has been fed with sheep for the past twelve months, or the aftermath of an old grass field, will generally keep them healthy. If the lambs are intended for the butcher as hoggets they should now get a liberal allowance of corn or cake, which they should have been taught to eat before being taken from the ewes. This will bring them in good condition to the turnips, a most important point; for if put on turnips weak, many of them will die, and many more not improve for some time. Before being put altogether on turnips a few should be given them on the grass, to teach them to eat them and to accustom them to the change of food. About the middle of October they should be put on turnips altogether; and then, no matter what their allowance of oilcake may be (and some will be required to get them fat by the spring), they should get from half to three-quarters of a pound of oats daily. Until I began this system I lost a large percentage of sheep on turnips. They should also have a constant supply of good oaten straw or hay in racks; I prefer the former, and if a little is trodden into the ground it is not of so much consequence. The turnips should be cut in pieces the size of a man's finger, by a machine made for the purpose, and given to them in troughs. By this treatment lambs bred from the common sheep of this country by a good ram will come to 18 and 20 pounds a quarter at 14 months old.

If fat lambs are desired to sell to the butcher at a few weeks old, I have found it a good plan to have them dropped earlier —say at the end of December or beginning of January. When dropped they should be kept in a sheltered field (or, better still, one with a shed in it) with their dams, and the latter should have a constant supply of good hay, a few sliced turnips, and a liberal allowance of corn and cake. By this means the lambs will be ready for the butcher in about eight weeks; and the ewes, if they were in good condition when they lambed, very soon after.

We have now come to the pig, and I will freely confess that I have not found the feeding of pigs very profitable. A good breeding sow will pay, and a pig that lives on the refuse of the house, helped out with a stone or so of meal or bran in the week, is a profitable animal to keep; but as a part of the live stock of the farm I have very little worth hearing to say about them. I will, therefore, read you an extract from a letter which appeared last year in the *Farmers' Gazette*, from Mr. William Joyce, of the Abbey Farm, Waterford, a most successful breeder and exhibitor of Berkshire pig. He says: "There is no animal that will put on the same amount of flesh in a given time with the same amount of food as the highly bred pig. The Berkshire pig is a particularly thrifty, strong, hardy animal, and can bear any sort of weather: he does not want a sunshade in summer to keep him from the sun, nor a great coat in winter to keep him warm; and another great advantage is, that no pig will feed on the grass like him. My breeding sows nearly live on the grass all the summer, even up to this time (November), they get only one feed of pulped roots in the day, besides what they get on the grass fields. I never cook any roots (except potatoes), but give everything in a raw state to cows, horses, and pigs. I have at present over 50 pigs, and every one that is able to eat gets pulped turnips: I find they do well on it, and the saving in labour and fuel is something considerable. People who come to see my pigs are greatly surprised to see them eating raw turnips, and to see them in such condition. I do not feed them on mangels if I can avoid it till some time after Christmas. The way I use my pulped food for the pigs is by putting the pulp into a large cask, and pouring over it a few buckets full of boiling porridge made from Indian-meal, leaving it a few hours to cool, and then it is fit for use."

To this I will only add that the remark I made that all young animals should be kept in an improving state applies with equal, if not with greater force, to the pig. From the time of his birth to the time he is slaughtered he should increase daily in size and weight—every day that he does not do so he is a loss to his owner.

We now come to the rearing and feeding of the horse—the animal of most interest to the general community, if not to the agriculturist. The farmer may not have all the appliances and arrangements of a stud farm, with its paddocks, open yards, loose boxes, &c.; still he may like to rear a foal or two every year; and, without entering deeply into the question whether it pays to breed farm-horses, I think most will agree with me that it is better for a farmer to have horses to sell than horses to buy. Moreover, few farmers can afford to give up the whole time of their brood mares to breeding, nor do I see any reason why they should. Neither the mare nor the foal she is carrying will be any the worse for her regular work on the farm; provided she is well fed, and not put to extra hard work, nor to work which she has been unaccustomed. Of course, the nearer the mare gets to her time of foaling, the lighter must be the work required of her; and a week or two before the time she should be left perfectly idle, especially if not in high condition. If the mare foals very early in the season, and the weather is bad, she and the foal should be put into a loose box at night, and allowed as much liberty by day as the weather will permit; but if she does not foal before the month of April, she may be kept in a sheltered field day and night, and unless the pasture is very good, a feed of oats should be given her every morning. Now, we all know that the foal would be better if his dam had nothing to do but to suckle him until he is old enough to wean; but I am speaking of rearing horses on farms where the work of the farm is of primary and the rearing of foals of secondary importance. In general, then, the mare may be put to work a fortnight after foaling, and when she is at work, the foal should be shut up in a light, airy, loose-box, and the mare taken in to suckle him at intervals of not more than two hours. Of course, the mare must be highly fed when doing this double work, and should have as much green food as possible. In addition to the dam's milk, I always give the foals of my working mares a quart of cow's milk, brought to a natural heat—a pint about an hour and a-half after the mare has gone to work in the morning, and a pint in the afternoon. At first the young thing is very shy, and is frightened at being caught and having his nose held into the milk; but he soon learns to expect it, and will come and drink it out of the vessel when held to him. When the turnips are all sown, and there is very little work for the horses, the foal can get two or three months of uninterrupted liberty with his dam. I find the most convenient time to wean is when the working horses are brought into the stable at night. By that time the foal is accustomed to the company of the other colts (or a donkey will answer the purpose, if there are no other colts on the farm), and will stay quietly with them without his dam. In about another month (according to the season) I bring him in also at night, putting him with another of the same age, or not more than a year older, into a loose box, and giving them as much chopped furze and hay as they will eat, and three or four pounds of crushed oats; and here let me remark, there is no time of his life at which a horse gives a better return for a few oats than the first winter. I turn them out the whole day in all weathers, except very hard frost or snow; and put them out altogether as soon as the weather and grass are good enough. The feeding the second winter is merely a repetition of the first.

And now, having reared the horse, let us consider his feeding after he has arrived at maturity; and, as we are speaking only of the rearing and feeding of farm-stock, I shall confine myself to the feeding of farm horses. Now, a farmer not only requires to feed his horses well, so as to keep them up to their work, but also economically. To this end, it is indispensable, in my opinion, that he possesses two machines, viz., the furze-cutter and oat-bruiser; the price of the hay and oats saved will soon repay the cost of both. I find that my horses do as well on 10½lbs. of crushed oats as on 14lbs. of whole oats. They are fed in the following manner: From the time they are put to regular work after harvest, and stabled at night, they get 3½lbs. of crushed oats the first thing in the morning (at five o'clock in the autumn and spring months, when they go to work at half-past six; and at six, or a little before it, in the dark winter mornings, when they cannot work till after seven), about an hour and a-half before they go to work. At twelve o'clock they get another 3½lbs. of oats and a pannier of chopped furze, and at night another 3½lbs. of oats and two full panniers of furze. On this feeding I have kept several horses in really good working condition all this winter; but I have some horses (not of my own rearing) which will not eat enough furze, and to them we give a little hay in addition. About the end of March the furze becomes less nutritious, and we substitute hay for it; and as the days are then long and the work hard, we give, in addition to the three feeds of oats, a small bucketful of boiled swedes, mixed with a little meal or bran, to each horse at eight o'clock in the evening. I do not allow the cost of the meal or bran to exceed 1s. per week for each horse, so that the feed, including turnips and firing, costs something less than a feed of oats. If the turnips are finished before we can cut any grass or vetches, I give a feed of boiled barley instead; this costs as much as a feed of oats, *exclusive* of the firing. As soon as grass or vetches can be substituted for the hay, I find two feeds of oats sufficient without any boiled food. As soon as the turnips are all sown, I turn my horses out; and as there is then very little work to be done, and only one, or at most two, are required to be at work at the same time till harvest, I give them no more oats. This run out to grass during the summer months I consider is essential to the horse's health.

The cost of each horse per annum will thus be as follows: 10½lbs. of oats a day, reckoning the oats at the extreme price of 1s. a stone, will be 9d.—*i.e.*, 5s. 3d. a week, or £6 16s. 6d. for twenty-six weeks. The cost of the furze is merely the rent of the land on which it grows, as there is no expense attending its cultivation; the cost of preparing it is about 1s. a horse per week; this gives 26s. to be added to the £6 16s. 6d., making the cost of feeding for twenty-six weeks from October to March £8 2s. 6d. We now come to eight weeks during which the horse is fed on hay, and has an extra feed of boiled food at night, to be reckoned at the same price as a feed of oats. This will give 1s. a day, then, for four feeds —*i.e.*, 7s. per week, or £2 16s. for the eight weeks. As for the hay, I must confess I have never weighed it, but I think we may put it at one hundred weight and a quarter a week—say 4s.; this gives 32s. to be added to the £2 16s., making £4 8s. for eight weeks, from the beginning of April to the end of May. We have still some four weeks left, during which the horse requires two feeds of oats a day; these at 6d. a day will amount to 14s., and reckoning the cut grass at 3s. per week, will make 12s., or £1 6s. for the four weeks' feeding. During the remaining fourteen weeks of the year the horse gets no corn except a few sheaves of oats in harvest-time, and perhaps a feed of corn now and then, if he has to go a journey, which I think need not be reckoned in the cost of his keep. Valuing his pasturage then at 2s. 6d. per week, we have the sum of £1 15s. for the remaining fourteen weeks' keep. We have, then, £8 2s. 6d. for twenty-six weeks, £4 8s. for eight weeks, £1 6s. for four weeks, and £1 15s. for fourteen weeks' pasturage, giving the cost of each horse for the year £15 11s. 6d. To this must be added something for the furze (a horse will eat about a quarter of an acre), and something for the wear-and-tear of the furze-cutter and oat-bruiser (I have had mine in constant use for ten years, and they are doing their work as well as ever). With whole oats the cost would be £4 more on each horse per annum.

I do not know that I could add any more on the rearing and feeding of live-stock from my own experience, I will therefore conclude with an extract from an American paper, the *Country Gentleman*: "It is, perhaps, well for the cause of good management that all neglected treatment of animals should result in loss to the owner. If he has starved his cattle, sheep, and pigs for a year or more, he cannot atone for it by sudden attempts to push them to fatness. On the contrary, the only way is to see that growth continues without cessation, summer and winter, from the earliest period of their existence till they are finally sold in the market. A single check given to this continued progress may arrest or retard it for months. Our own observations lead us to the conclusion that the whole profits resulting from rearing and fattening, when this continued progress is kept up by careful, regular, but not extravagant feeding, are at least triple the amount realized from early neglect and heavy feeding afterwards, and often the difference is many times greater than here stated."

There is nothing that should be more strongly impressed on the minds of the young farmer who makes the feeding of animals a prominent part of his business, than the importance of keeping up an unremitting growth throughout the whole course of their existence.

AGRICULTURE IN THE COLONY OF NATAL.

While it is the proud boast of an Englishman that the sun never sets on the dominions of his Sovereign, it is an additional source of gratulation to him that, wherever the power of his country is established, its language, laws, and social institutions inevitably follow, and become acclimatized, if we may so apply the word. No people of Europe have displayed so great an aptitude for colonization as those of the British Isles, who are proverbially prone to rove the earth in search of some favoured nook where they can exercise their time and talents to the best advantage. And well have they, in general, sustained the honour and character of their race for industry, order, and business-like talents. We have only to look to Canada for an example of this, where the emigrant colonist meets with no influences to induce him to renounce either his native country, his loyalty to his Sovereign, or her institutions. It is different in the United States, where Republican institutions, acting upon a highly-mixed emigration, has, in the course time, created what may be considered a new and peculiar race, having neither a social nor a political character in common with those of the people from whom they originally descended, and retaining only the language to identify their lineage. There are, it is true, great exceptions to this description; but, as a rule, it is rather a boast than otherwise with an American that their institutions, social and political, are far superior to those either of England or any other civilized country on earth. In Canada, living, as a people, under the mild sway of a popular Sovereign, and enjoying, at the same time, self-government to an extent equal to Republicanism, the people have no inducement to renounce either their lineage or the supremacy of the mother-country, but, with their loyalty, retain rather the manners and social habits they have heen accustomed to "at home," and assimilate their institutions, both social and political, to those they have there been accustomed to, with such alterations only as the requirements of a young colony demand.

Australia, New Zealand, and the Cape of Good Hope, or Southern Africa, are proceeding upon the same model, and have adopted the free institutions of the mother-country, and it is reading the report of one of those in the latter colony that has suggested the above remarks. The report is that of the Pietermaritzburg Agricultural Society for the year 1866; the name, which is that of one of the counties of Natal, in Southern Africa, is suggestive of its Dutch origin as a colony, and it is well known that the Dutch were the first colonists of that part of Africa, subsequently taken from them during the wars of the French Revolution in 1795; and although ceded again to Holland at the peace of Amiens, it was taken once more in 1806, and finally given to England by the Congress at the peace of 1815, as retained by her ever since. The colony at Natal, however, was established at a subsequent period, and, lying at the distance of five or six hundred miles from the Cape, may be considered as separate from, though politically dependent upon, that of the Cape. It is only within the last twenty-five years that Natal has attracted much attention as a resource for British colonists; but for the excellence of the soil and the fineness of the climate, lying as it does on the east coast of Africa, and between four and five degrees more north than Capetown, it has, within the last ten or fifteen years, grown to be of considerable importance, as exclusively an English colony, in which respect it differs from the Cape, where the population consists also in part of the ancient Dutch families, who, however, are fast becoming assimilated in habits and manners to their conquerors.

Natal, like all young countries, depends chiefly on her agricultural productions; and, copying from the mother-country, is employing the same means for promoting the interests of that branch of industry by the establishment of agricultural societies, of which, as we gather from the Report before us, that of Pietermaritzburg was one of, if not actually, *the* first that was set on foot. Be this as it may, it is pleasant to see the offsets of our race thus multiplying our institutions south of the line, and even at the antipodes, in Australia and New Zealand. We We are not aware how long the society under review has been established; but we find all the means employed by the societies in England adopted by them, and the improvement in every branch of husbandry provided for by prizes awarded to the best types of produce, whether animal or vegetable. The breeding of horses is particularly attended to, and five thorough-bred stallions were exhibited for the prize, India being the country in which the breeders of that description of stock are now looking for a market.

Wool, however, must at present be considered the staple produce of the country, as it is that of the Cape colony. Sixteen prizes were given for the best types of the different breeds of sheep, and fourteen for the horse stock; ten for horned cattle, and so on, for every description of produce. Wheat is not much cultivated, the climate not being adapted to its growth. Of upwards of 44,042½ acres of cultivated land in the colony, only 1,324 acres were under wheat. Indian corn and Caffre corn, on the contrary, grow rapidly, and yield a large produce, the former occupying 28,342, and the latter 8,953 acres. The Silesian beetroot attains the marvellous weight of from 90 to 100lbs. The entire number of acres cultivated in the colony of Natal is 44,042½, of which 10,661¼ belong to the county of Petermaritzburg. The number of horned cattle is 303,344, of sheep 212,874, and of goats 151,824.

A Natal wool show was also held at the Town Hall, at Maritzburg, in December last, under the auspices of the Agricultural Society, when prizes were awarded, from 10 guineas to 1 guinea, for the best specimens of the various classes of wool, washed and unwashed, the awarding to be referred to the house of Morrison and Co., Philpot-lane, London, to whom the competing specimens were to be sent for their decision. A merchants' cup, value 25 guineas, to be given in addition to the sum of 10 guineas to the exhibitor of the best five bales of 200lbs. each, of merino or cross wool, clean fleece-washed, of one clip and flock. Thirty-four prizes were offered, under certain conditions necessary to secure perfect fairness and honesty in the competition. These being complied with, no one, whether a subscriber or not to the Society, is excluded from the entry.

We can heartily congratulate this young colony—the youngest, we believe, under the British Government—on the liberality and public spirit displayed in this effort for promoting the welfare of its agriculture and commerce, the former of which must be its mainstay for many years to come; the latter being necessary for the disposal of its surplus produce, of which wool is likely to form the largest proportion. We gather from the Report, that Natal will be represented at the Paris Exhibition, now being held, in order to make more known the large and varied resources of the colony, and attract to its shores "the capital, skill, and labour which are alone wanting for their development."

THE VALUE OF MAN IN AGRICULTURE.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

SIR,—In studying the vineyards of France, I have seen many things in agriculture to which they are intimately allied, which have produced in me a series of ideas that I have no claim to think just, but which possess me by their obstinately presenting themselves to my mind, incessantly, as having a certain character of utility. You have told me so many times that we must say and publish everything, in order to promote the truth, that I have decided to send them to you, arranged in my best manner, but without being quite sure that they are very clear or of much value, considering my incompetence in pure and general agriculture. It is also in order to discharge my conscience thas I address them to you, submitting myself, as always, to your superior judgment, whether to send them to the press or to the waste-paper basket.

The mutual appliances, the instructions, the agricultural encouragements, of the present day are admirable, not only in their generalities, but still more in their minutest practical details—the knowledge of climates and soils; deep or superficial culture, intensive or extensive; the choice of cereals, forage-plants, roots, tubers; the influence of seasons; the distribution of crops; manures, improvements, drainage, irrigation, viability; the selection, rearing, and foddering of farm-cattle and fowls; the exterior and interior farm-implements; mechanics and agricultural constructions; the harvest; the preservation and employment, direct and industrial, of the products; book-keeping, &c., &c.

All this is studied, taught, encouraged, and vulgarised to such a degree as to give room for surprise that the abundance of all the products of agriculture should neither produce leisure of life nor cheapness of living, nor a rapid increase of population, especially in rural districts; and we are justly astonished that effects quite opposite to those we have a right *speculatively* to expect, are displayed *positively*, and even threaten to increase.

This defeat has nothing disastrous about it. On the contrary, it will wonderfully aid our progress—first of all, in securing to it all the value of the facts acquired in an exploration, speculative indeed, but followed up by the more enlightened minds, under the inspiration of the most generous sentiments; afterwards, in showing to every one the error committed—the only error, but which must vitiate all the reasonings, falsify all the calculations, upset all the results—namely, the ignoring of man. Man is the Alpha and Omega of agriculture. He is the first cause of all agricultural production; and agricultural, manufacturing, and urban products acquire a value only by his consumption.

After those men supporting life on natural products—hunters, fishers, wandering shepherds—requiring, in order to live, the range of considerable spaces, and unable, even with that, to form either numerous families, extensive commerce, large manufactures, or great cities, or arts, or sciences—come the husbandmen, who have learned how to obtain, from a fixed and very limited space of country, an easy, abundant, and certain livelihood. By the side of one family a second established itself, then a third, a hundred, a thousand; and thus it is that Agriculture has commenced to be, not the nurse only, but the mother and the nurse of the great human societies which it alone has also been able, and will for ever be able, to produce and maintain.

But it must have been soon perceived that one agricultural family produced with ease the food necessary for the support of two or three families, by the direct employment of its forces, and upon a very limited space. Other families have been, therefore, able to cease employing themselves with husbandry, and occupy themselves with trade, the arts, commerce, manufactures, sciences, literature, &c., and to group themselves into agglomerations more or less considerable, constituting communes, towns, and cities, living by labour and on rural products, exchanged directly, by barter or by commerce, for those of trade, arts, manufactures, science, letters, &c.

However, it is easy to conceive that, for want of observation or sufficient enlightenment, too many families may abandon, and in fact do abandon, rural production to find employment in manufacturing and urban works; and agricultural produce becoming less abundant, the rate of their exchange rises, which is as much as to say that that of the urban and manufacturing products is reduced in an unwise proportion, from whence arises the embarrassment of the manufactories and cities. But in order to profit by the high prices, the rural families will redouble their efforts, and rise to the summit of human labour, even to fatigue and exhaustion, and hence arises the embarrassment of the country.

In this difficult position come the exigencies of the hand-labour of both the cities and the country. Men are scarce for the manufactories, which are compelled to offer more products; men are scarce for husbandry, which is obliged to produce more and more; from whence the embarrassment is transformed into a serious danger for all, and decided ruin for a great number.

But another scourge comes still to join itself to every situation between production and consumption—the monopoly and coalition of the intermediaries, who have broken down all the relations between the producer and the consumer; who purchase cheaply of the first, who is pressed to sell in order to pay his expenses; and who sells below the value to the second, who must live. Lastly, as a final consequence of the high price of commodities is their multiplication by all possible adulterations.

We generally think of remedying the insufficiency of hand-labour by the employment of machinery in agriculture. This is an error. Machines in agriculture as well as in manufactures, when they are really good ones, are a valuable acquisition for human labour, and every one ought to employ them. But machines alter nothing as regards the necessaries of life between the producer and the consumer, whether manufacturing or rural. The less the rural population of the country becomes, the less will they consume of the products of the cities and the manufactories, and the dearer they will sell their own. So that if only one machine, or ten, or a thousand could replace the twenty-four millions of French agriculturists, leaving them free to go and swell out the cities and manufactories, these latter would be destroyed.

The more densely the country is peopled the more abundant and cheap will be the necessaries of life, and the more will the cities and manufacturers be prosperous and rich, by the facility of living on the one hand, and on the other by the advantageous disposal of their goods.

But will not the abundance and cheapness of provisions while promoting the prosperity of the cities and manufacturers ruin the over-numerous husbandmen? Yes, if they are also manufacturers; no, if the husbandmen are truly such.

It is on this ground that I place the explanation of the most serious reproach that I bring against our studies, instructions, and agricultural encouragements—the *ignoring of man!*

As the only hunter was the man who followed the chase, the only fisherman he who fished, the only shepherd* he who pastured his flocks, each in order to find food for his family, and not he who employed hunters, fishermen, and shepherds, paying them a salary; so the only agriculturist who cultivates the earth with his family, and not he who causes it to be cultivated by others for wages; this is a manufacturing husbandman.

The husbandman, properly so called, if he knows how to gather all that is necessary to his existence on the land that he and his family can cultivate, has nothing to fear from the abundance of the products, and less still from the dearness and ill-will of foreign hand-labour; he sells more or less of his superfluous goods, that is all; and the dearer hand-labour becomes the more his labour adds to the value of his products.

The agricultural manufacturer, on the contrary, sees the return price of his products incessantly increase by the scarceness, dearness, and the ill will of the hand-labourer; and if, by favourable seasons, or even by agricultural progress, the productions similar to his own become abundant, and fall to a price below their value, he is ruined. If on the contrary, the harvest is bad, by the numerous expenses he has paid in hand-labour, he is even more severely reached than he who requires by his own labour only his food and raiment.

Experience also confirms throughout all France the truth of what I have written. The owner of small property cultivated directly by the family, if it supplies him with his bread, his wine, his pork, his milk, his roots, his pulse, and his fruits, enriches himself surely and quickly by the sale of his surplus; whilst the large proprietor, who works his property by the labour of others, is ruined, and falls fatally into the hands of the small proprietor.

It is therefore evident, first and foremost, that in order to ensure abundance and cheapness of the alimentary commodities of the first necessity, without ruining agriculture, we must depend only upon small properties worked directly by the rural family, and not upon the middle nor the great properties, worked on the manufacturing principle, by paid labour, or by machinery. Why then do our studies, instructions, and encouragements, exclusively excite this last species of farming? Why do the small proprietors, while accepting what appears to them good of the instructions, remain nearly strangers to studies and encouragements? It certainly is not ill-will or opposition; so far from it, on the contrary, never has any country at any period made greater efforts than ours to develop the population, the agricultural activity and production, cheapness of the necessaries of life, and private and public wealth in every direction. It is, therefore, as I have said, not in that quarter we must look for a deviation or omission easy to be repaired.

All social wealth comes from the agricultural family, and the more of these there are in a country, the richer, the more prosperous, and powerful will it become; the more abundant and cheap are the necessaries of life, the more easy will it be to dispose of the manufacturing and urban produce to advantage and with ease. Therefore, the first object of the studies, instructions, and agricultural encouragements ought to be the knowledge, the creation, the proper position, and the multiplication of the agricultural family in every circumscription, on a space of land as restricted as possible, just sufficient to absorb, by its labour, without weakening them, the powers of the agricultural family, giving it in return, first, an existence, certain, healthy, irreparative, conservative, lodging, clothing, food; secondly, the interest of capital; thirdly, the savings, or profit, over and above the annual outlay of the family.

The problem is easy to solve everywhere; for, in Russia as in America, in Germany as in France, in Italy as in Switzerland, if there is a truth demonstrated by bondage (*serfage*), by metayage, and forages, it is that the direct and manual labour of the agicultural family, on a soil of average fertility, produce at least by twice and a-half its own requirements, of which, in sharing its products with the proprietor, it takes its own division, pays his rent, and retains also a sufficient profit.

The human family being, in short, considered a dynamic agricultural unity, composed of intelligence, activity, and power, it is necessary to constitute, or at least acknowledge it valuable in itself. An adult man is worth from 300f. to 600 f. per year, including lodging, food, and clothing. A woman is worth from 200f. to 300f., and two children of the ages of from one to twenty years are worth each 100f. to 150f.; or a total value of such a family of from 600f. to 1,000f. per year.

An average family, giving to the land all its strength, activity, and intelligence, makes therefore, with its risks and dangers, a return of 600 to 1,000 francs a-year, equivalent to a capital of from 6,000 to 10,000 francs, at ten per cent. This is exactly the price we pay for a negro family; and this approximation suffices to prove that I set at the lowest the value of the European family.

What do the colonists, the large proprietors, and the middle proprietors owe to the agricultural families they wish to instal upon the land as half the products? On a value of from 6,000 to 10,000 francs on land, buildings, moveables, cheptel, and advances on account in production, they ought to make a profit at least equal to the value of the family, keeping, at their own charge besides, all the first dead stock, all the repairs, the sanitafy arrangements, liming, marling, and taxes, because the value of the soil will receive an increase with which the metayer has nothing to do; and besides, the agricultural family owns only what it possesses—its strength, its activity, and its intelligence.

The family demands, before all, the rent of its capital, which is its living; and it can no more dispense with it than the working ox or horse can dispense with its forage; and the colonist, whoever he may be, ought to take care that the cultivation is of such a nature, and performed in a manner to assure the life and health of his labourers, with more solicitude than he would for his cattle and his machinery, or than the planter does for his slaves. In proportion to the number of families he has on land does he possess of intelligent forces of 6,000 to 10,000 francs each, which return to him, in excess of their own support, from five to ten per cent. of his fixed capital, which is doubled, tripled, quadrupled in value, besides, in a short time, by the single fact of the population which resides on the surface.

The middle and the large estate worked thus by metayers, directed paternally, or, rather, patriarchally, then becomes an agriculturist, properly speaking. He who directs them is a farmer, or rather a true chief of agriculturists, beyond the reach of the vicissitudes and decay of the manufacturing agriculturists; speculators who are at the mercy of workmen and paid labourers; crushed by abundance, and low prices, and bad harvests; agitated, needy, compelled to descend into all the details, and to share all the cares and accumulated annoyances of the shepherds, pig-herds, cow-herds, ox-herds, horse-dealers, farmers, &c.

But what is still more singular is that the agriculturist, passing his life in instructing, directing, and helping men, and imbibing freer sentiments, sympathising and worthy speech, and magisterial authority, which impart these noble functions, realizes at the same time, without agitation or disquietude, and without any risks, products half and three-fourths more than the manufacturing agriculturists, all things in other respects equal. Thus, 200 hectares, in thirty metairies of six hectares each,* well-managed, will return, with ease, 30,000 francs (£1,200), when the manufacturing working, most skilfully conducted, would only produce 20,000 frances. I have seen this difference in twenty departments; and it increases more in proportion with the greater extent of the domains.

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* I call *man*, hunter, fisher, shepherd, agriculturist, the *genus homo*, the reproductive unity of the human species. An unity composed of a husband and wife, indissolubly united containing children in their bosom, and becoming father, and mother by the evolution of those children—such is man, in truth. The boys and girls are not the man, they are fractions or fragments of him. In agriculture the *genus homo*, the family, is the dynamic unity. I suppose it to be composed of a father, a mother, a boy, and a girl, subject to the absolute paternal law in that of the commune. The father, the mother, the eldest, the youngest; such is the hierarchy. The authority, the force, directed by mildness; such is the motive power. The father makes the provision abroad, the mother keeps it, prepares it, and distributes it in the house, the children assisting both by docility; such are the duties relating to material life in the agricultural family.

* Plus the house and the reserve of 20 hectares to the master.

If, therefore, large and medium proprietors are introduced into manufacturing agriculture, instead of giving the preference to patriarchal agriculture, it is because they have been attracted into this course by the studies, instructions, and official encouragements, inspired themselves by great agricultural theories, fashionable for the moment, and by the importance attached to the practices, accessory and in detail, beyond the true sphere of the working farmer and the *metairie* landlord. Indeed, after many years of efforts, or rather after the prizes and honours obtained, the generality of the manufacturing farmers—neophytes especially—lose no time in letting their land to farmers, and relieve themselves thus of a burden too heavy for their resources, and too rough for their character and spirit.

I do not here intend to blame the direct farming of one's own estate, established for a long time upon given and local customs, and above all, satisfying traditionally or momentarily the aptitude and taste of the families and their heads. I only say, that agricultural progress, and the increase and cheapness of the produce, the increase of the rural population, are not thus affected, nor in the increase of the large and direct manufacturing agriculture whether studied, taught, or encouraged during the last thirty years; I say that it no longer concerns the study only of the bovine, porcine, and ovine breeds, which are the small part of the question; but that the time is arrived for occupying ourselves with the human race, its value, necessities, and capabilities, its powers, and its works, its reproduction, and its produce in agriculture; that this is the great side of the question, which, more delicate, minute and serious in its studies, instructions, and encouragements, has been completely left in the shade, if not in oblivion.

I am surprised that this view of the question has not long ago engaged the attention of the agricultural publicists, for from time immemorial the search for and sale of slaves has revealed the importance and value of man in agriculture. Even in our own day, have we not seen audacious filibusters brave the most sacred laws of humanity, expose themselves to the most terrible punishments in carrying off negroes, transporting and selling them at the price of five or six thousand francs in places where agriculturists do not pay more than a hundred francs for an ox or a horse? There was, notwithstanding, more mechanical strength in the animal than in the negro; the address and intelligence therefore of the man have a high value.

Have we not seen that the number of negroes would of itself alone determine the value of a plantation and the income of the planter? Was it not the case also until recently in Russia, where the number of the peasants alone indicated the wealth of the domain?

But the observation proves still more; it proves that out of slavery and serfage the freeman produces double and triple of the serf and the slave. Why not, then, favour European migration, its installation and multiplication in the depopulated districts of France? Why not offer the immigrants an asylum in the large and middle properties? What has America done to carry off annually from Europe 200,000 colonists across the seas in the midst of the dangers and uncertainties of a country still half savage? They have simply offered them land, space, freedom, the common law, and an easy access to the rights of American citizens. Have we not something better than that to offer in return for the simple labour of the family?—the advance of a portion of land, a house, a cheptel, and means of existence, even to a share of the produce equivalent to a capital of from 6,000 to 10,000 francs, the protection of our laws, the benefits of our civilization, the guarantee of an equitable share between labour and property, and the honour of becoming French? What people can offer more, in the universe?

But the value of man in agriculture has not been made either a study or a fashionable consideration, though we see true deserts in all parts of France—in the Sologne, the Landes, the Double La Crau, the Dombes, the Braine, and numerous and vast properties, almost without cultivation or inhabitants, in forty departments. And do we not see the service in manufactures, cities, and the country becoming daily more difficult and incomplete? do we not see hand-labour become more and more scarce, dear, and bad everywhere, because the rural workman by the day and at a fixed price cannot establish a family? because the large and the middle properties, as well as the small, do not care to have numerous families? and because the rural proletarian has no longer a home, not any one knowing his high value and absolute necessity?

It is therefore urgent now to consider the rural family as a dynamic agricultural unity; to appreciate comparatively the extent and the limits of his intellectual and manual action, applied to the cultivation and the production of the soil; to appreciate and measure his necessities; to determine in each locality the number and the nature of the cultures which can best satisfy them; in short, it remains to fix the most limited extent of land those cultures should receive to produce the quantities indispensable for the support of the family, the payment of rent, and the constitution of his savings. To the extent of land sufficiently restricted not to exceed the strength of the family, and fertile enough to satisfy all his wants, it will be proper to add his worth, as well as that of the constructions and appropriations indispensable for setting it in action. No hives, no swarms; no swarms, no honey; to every swarm its beehive.

The determination of the circumstances and conditions indispensable to the habitation and nourishment, the clothing, rent, savings, the first starting, the preservation, and perpetuation of the agricultural *dynamic unity*, should constitute the agricultural *plastic unity*, the extent and total cost of which should be specified.

Each plastic unity, or, to speak more simply, each small *metairie*, would necessarily vary in its extent, according to the nature and quality of the lands, their fertility, and facility of culture; in its species, vegetable and animal, to be cultivated according to the climate, and in its capital advanced, according to the difficulties of the constructions and appropriations, the value of the soil, expectations of the first crops, &c.

All these determinations in the different countries might be re-united and classed in tables, which should be tables of agricultural equivalents, or, at least, tables in which the relative values should be rapidly assessed, if not with accuracy, at least with a sufficient degree of approximation.

The basis of the agreement ought to rest upon the paternal authority and advice of the proprietor; all the products should be divided into equal parts, the proprietor furnishing all materials of improvement, and the colonist supplying all the agricultural hand labour. The agreements should be annual, and the colonist, as well as the proprietor, should have the power of putting an end to it on the fifteenth of November of any year, after all the crops are gathered, and without the *metayer* having anything to do with the growing, or future, harvests. This freedom is, according to my observation and experience, the most solid guarantee of perpetuity. Patience and forbearance are easy to those who feel themselves at liberty to abandon, but difficult to those who are bound to a system.

The study of agriculture, in this point of view, cannot proceed on general principles; but it is easy by local enquiries on the essence, quantity, and value of the products; the mode of culture; the nature, composition, quality, and management of the land; of the value of manure and composts; on the modes and prices of constructions; on the climate and healthfulness of places. In default of information on certain points, men familiar with agricultural science and arts may judge by induction of the fitnesss to introduce better and more profitable productions, better understood culture, improvements and sanitary arrangements of the soil, &c.

Instructions should be equally special to the circumscriptions and, above all, drawn into the most advantageous practices observed in similar conditions of soil and climate; in the indications of better proportions of grain, forage crops, tubers, roots, legumes, and plants to be cultivated; animals to rear; in the best known processes of culture, in order to obtain the most favourable results; in the case of insalubrity and endemic diseases, in the indication of better hygienic practice, preventive and curative.

Lastly, the encouragements, prizes, medals, decorations, and even titles of nobility should be given to agriculturists and landlords, without special regard to animals, implements, or machines: to the first, for having done the best and given the best examples in their metairie; and to the second, for having established upon his estate the greatest number of rural families in the most productive and honourable conditions.

Thus would the real importance of the farmer, in his relation to agriculture, be awarded; thus should we secure abundance and cheapness of provisions, without suffering or complaint; thus would capital—rural, manufacturing, and urban—be increased, and consequently the riches and power of the State.

DR. JULES GUYOT.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

RECLAMATION OF LAND FROM THE SEA.

At a meeting of the Royal Agricultural Society of England, which took place on Tuesday evening, April 30th, in Hanover-square, Mr. Thompson, the President, in the chair, the subject of " The reclaiming of land from the sea, and the formation of tidal and other banks," was considered.

Mr. S. **Shellabear** (agent to the Earl of Leicester) contributed a paper on " The enclosure from the sea at Holkham." In his absence it was read by the secretary, Mr. Hall Dare. In the course of his observations, the author said, the inclosure of this land was commenced by the Earl of Leicester, in the summer of 1856, by the erection of a short length of embankment of about 150 yards, at the western end, excluding the sea, which flowed over it in that direction from Holkham Bay. At this time the land was protected from the sea, on the north side, by a long range of sand hills of considerable width and height, covered with marram, the growth probably of a long series of years ; and there is, perhaps, no more secure protection against the sea than these hills, with ordinary care and attention in repairing with rows of faggots the occasional damages made from time to time by currents of wind, and planting the new-drifting sand with marram on the south side, where the grass-marshes, enclosed many years since, and the whole of the eastern end, open to the shifting channel of Wells Harbour, which formed its boundary in that direction to a length of a mile and 200 yards. The embankment here was the heaviest portion of the work connected with the inclosure ; it was commenced in the spring of 1857, and completed in the autumn of 1858, starting from a point at the western end of Wells Quay, and running in a straight line alongside the Channel, nearly due north to a high shingle beach, forming the eastern end of the sand hills, and crossing the old channel twice in its length, a new one having been previously cut to the eastward. The south end of this bank being upon the high level clay deposit, is formed entirely of that material for a distance of about 400 yards, but the remainder of it is built upon the sand, and is formed entirely of sand inside, protected on the sea side by 2 feet thickness of puddle (dipping at the foot 5 feet into the sand), and on the land side by 12 inches. The width at the top is 5 feet. On the sea side its slope is 4 to 1 for a distance of 8 feet from the top, and 5 to 1 for the remaining distance upon the land side. The portion made in 1857 had a slope of 2 to 1 to a distance of 8 feet from the top, and then 3 to 1 to the level of the ground. The portion made in 1858 was formed throughout to a slope of 2 to 1. The upper portion of the slope upon the sea side, and the whole of that upon the inside, were covered with grass flag, cut 3 inches thick. The top of the embankment and the 5 to 1 slope on the outside were covered with shingle. Experience has shown sand to be the better material for the construction of these banks, no settlement having occurred in the large one so formed, while the smaller one, entirely of clay, has been added to, to maintain the original dimensions. The sluice is in this bank, towards the south end, and is built in the clay upon piles : it is a barrel-arch of 3ft. 6in. diameter, with a self-acting sea-door, and a second door upon the inside, raised or dropped by a screw. Besides carrying off the water from the 580 acres of land comprised in this inclosure, it is required to discharge the drainage water of 1,000 acres of grass-marshes and the supply from some strong springs upon them. It is found to be too small to do this during the short time the tides will allow it to work, and not being in a good state from a settlement in the centre, it is contemplated to remove it and put in an arch of 5ft. diameter. The whole of this work was executed by Messrs. Buxton, of Manchester, from the designs and under the superintendence of Mr. Arthur Saunders, of King's Lynn. This bank has not received any serious injury since it was completed, except upon the inside during the winter of 1862 and spring of 1863 from the water inside, after the breach made in December, 1862—in fact, none beyond the occasional renewal of the flag and shingle being washed away, and the necessity of maintaining the shingle which protects the foot of it to a higher level than was originally contemplated. It should however be said that it is but little exposed to the action of the sea. Its sea-face is towards the east and adjoining the channel, on the opposite side of which are uninclosed marshes but rarely covered by the sea, with the additional protection of high sand-hills in the distance. The highest tides (which alone cover these uninclosed marshes) occur only with a west or north-west wind ; in an easterly gale, therefore, there is no expanse of water to break upon the bank, and in a gale from the west or north-west it is to a great extent self-protecting. The extreme north of this bank is connected with a high bank of shingle, with the sand-hills forming the remainder of the northern boundary. It was through this bank that the breach was made by the very high tide of December 22, 1862, which at the same time also broke over and swept away the short bank at the west end of the inclosure. The last was speedily replaced ; but the shingle bank, when once broken over, wasted rapidly to an extreme depth of 28ft. in the breach and a width at the upper part of 125 yards, and its repair was a work of greater difficulty. The breach was successfully closed in the month of June following with shingle, conveyed to the spot by two lines of tramway, from an average distance of about half a mile. The new bank thus formed, having a slope of 12 to 1 on the sea-side and 5 to 1 towards the land, has stood exceedingly well up to the present time, costing but little for repairs. Marram is rapidly growing upon it, and in a very few years it will probably become a high sand-bank, with a strong base and face towards the sea beneath the sand and about 5ft. above the highest tides. Of the 580 acres inclosed, above 200 acres adjoining the old grass-marshes were a strong clay loam, 80 acres mud land (originally skirting the high clay lands), 170 strong blue clay, or clay-loam, buried beneath the sand to a depth of from 6in. to 3ft., and the remaining 130 are either shingle, stones, or sea-sand, to an unknown depth. A very large portion of the land inclosed was therefore either almost worthless or required considerable outlay to bring it into cultivation ; and to this may be added, that from the meeting of the tides from the east and west upon the land, it was intersected by several large creeks and the best portions of it by innumerable small ones. In the autumn of 1859 the land was laid out for division into fields. One road, passing through the entire length, was crossed at intervals of about 500 yards at right angles by two others. These roads are each 30ft. wide, and are bounded on each side by a ditch. The lands between are again divided by a ditch into fields, varying in extent from 10 to 20 acres. Every field, therefore, has access to a road and is square—two very important advantages with steam-cultivation. In bringing it into cultivation the next operation was to fill up the large creeks, which has been done throughout the farm, sand being brought from a distance where necessary by means of a portable tramway worked with horses, or moved from the adjoining lands where available by barrow roads ; in either case the creek being ultimately brought to the level of the land on each side of it by a coating of soil of similar quality. In the same way the small creeks which appeared only in the stiff lands were filled up, or by digging, thus reducing the level of the adjoining land. By the summer of 1862, a large breadth of this land had been brought into cultivation : coleseed, peas, wheat, and oats being grown upon it, and a further portion was sown with wheat when the sea again came over it. Up to this date the crops were better than they have been at any time since, and it seems probable that the cultivated lands, especially those which had been subsoiled, became more strongly impregnated with the salt than when in their original state. The damage done to the watercourses and roads was inconsiderable ; but the land had become so thoroughly saturated as to be incapable of bearing horses until late in the spring, and the roots of autumn-sown corn were destroyed by the wet and salt in the land. Underdraining, which had been done partially before, was now systematically commenced, and up to the present time fields containing about 230 acres have been drained with $1\frac{3}{4}$-inch pipes at 12 yards distance in the clay, and 24 yards in the sandy subsoils, nearly all the drains emptying into the ditches. The fields being all flat, considerable difficulty was experienced in maintaining a regular and proper fall in the drains, the slightest dip in them in the sandy lands causing the drain pipes to tilt up. The plan now adopted is to set out the level of the outlets in the ditches, and a point 4 feet above the bottom of the drains to be cut across the centre of the field with a spirit level, adding the rise to be allowed in the drains. From these two points given him, the foreman is enabled to give an even fall to the bottom of the drain throughout its length, by placing a staff four feet long upon the level point at the outlet, and having a similar staff moved up and down the drain, aligning it upon the level given him in the centre of the field. Four levels only are given in each dish, and four across the centre of the field, the remainder being put in with the **T** staves in the same manner. By this means the work is satisfactorily done, and the foreman is able to superintend the whole, check the levels of every drain, and assist a second man in laying the pipes in the drains, of which about 16 to 18 chains are cut every day from April to August, the work being impracticable in winter. Four hundred and twenty acres of the land have been cropped, but only 340 are at present under cultivation; the remaining fields are being treated as follows: Some of the heaviest clay lands are being sanded to a depth of 3 or 4 inches by means of the portable tramway (two horses drawing a load of from 4 to 6 tons), 8 or 10 inches of sand being taken from the sandy fields for this purpose, to bring the clay beneath and within reach of the steam plough. In other fields where the clay is at a greater depth, pits are sunk, and the clay is barrowed upon the land to a depth of 5 or 6 inches (when solid), the sand having been previously reduced to that extent, and barrowed into the last pit sunk; and in others, where the clay is from twelve to sixteen inches from the surface in portions of a field, or where the sand is not required for the heavy lands, the ground is trenched, and from eight to ten inches of the clay brought to the surface. But in these cases, from the frequent occurrence of creeks in the clay below, the sinking of a pit is often necessary to complete the field, and make the soil equally good throughout. With respect to cultivation but little at present can be said. Good crops of wheat, oats, barley, coleseed, turnips, mangold-wurzel, and clover have been grown upon the land, both before and since the winter of 1862; but it was not until the summer of last year that we can be said to have recovered, to any extent, from the flooding of the land. As soon as they have been drained, the fields are broken up with Fowler's steam subsoil plough to a depth of sixteen inches, allowed to lie the winter, and put under crop the following year. Since the erections of the main bank, the work has been all done by Lord Leicester's own staff and labourers, with the surplus labour of the immediate district, under his own personal direction. It has necessarily, therefore, occupied a considerable time; and no steps have at present been taken to reduce the cropping of the land to any system.

Mr. R. B. Grantham, C.E., F.G.S., in opening the discussion, said he had taken some pains to collect information on the reclamation of land from the sea, and the formation of tidal and other banks, and was very glad of the opportunity to lay his practical experience before the Society. Mr. Shellabear's paper was very appropriate, although it had a local bearing, because it gave an example of the reclamation of land on the coast of Norfolk, showing at the same time that there had been some failures, and that the bank had proved very expensive. The question, on the whole, admitted of very general treatment, and was one well deserving the close attention of the Royal Agricultural Society. The Romans took a deep interest in the reclamation of lands in this country; and the custom of enclosing lands from the sea was extremely ancient. At the present day it had lost none of its interest or importance, but, on the contrary, demanded more and more the study and skill of the engineer. There would always be vast difficulty in the prosecution of the work, because in many cases the engineer was brought face to face with that powerful enemy, the sea, whose opposition never tired. The question was perhaps of more interest to the agriculturist than the engineer; and this was why he had determined to bring it before the notice of the society. In reclaiming lands from the sea there were several considerations which ought never to be lost sight of. There was, first, the question of area—whether it was worth while to make an expensive bank to reclaim a certain number of acres? Then came the question whether when the expense of shutting out the sea had been undertaken, the land would prove of sufficient value to be worked for agricultural purposes. In his own experience, on the coast of Essex portions of land had been reclaimed at considerable cost, but a long time elapsed before it could be utilized by the agriculturist. In these instances the land was rough in itself, and seemed to retain the salt of the sea so long that it was necessary to wait while a protracted course of air and rain dispersed the salt before it was fit for cattle to graze upon, and, in fact, some years elapsed before it was properly cultivated. On the other hand, he had known cases where the land had been brought into cultivation almost as soon as the sea had been shut out. He remembered a peculiar example in the case of one of the large rivers in Ireland, where the tenants of the landowners ran small walls, and shut out the sea. By this means the mud was enclosed, and the next year the farmers were able to raise a crop of wheat. In this particular instance he attributed the success to the river running over a large bed of limestone, and bringing down a deposit which neutralized the effect of the salt. The soil, too, was very rich, and under these circumstances perhaps it was natural that the crops would take almost immediate effect. Instances similar to this, he believed, had been experienced in Norfolk. The nature of the soil which the rivers brought down into the bays that were to be reclaimed was a highly important consideration. Limestone always neutralized the salt, but there were materials often brought down of a totally different character. Much skill was required in determining the kinds of banks to be used for different places. An engineer of even long experience could scarcely find two cases admitting of precisely the same treatment. The excavation for and formation of banks depended upon the surrounding circumstances, which of course were of the most varying description. Hence anything like classification was impossible. Generally speaking, embankments might be treated under three heads. One was an embankment of earth against the sea, with large slopes, and perhaps flat foreshores, where the waves did not break with great force, in which case the work might safely be done by sodding, and other similar contrivances. This method was as inexpensive as it possibly could be. The second method was banking against the deep water of the sea. This work required to be stoned with considerable batters on the one side and of considerable strength on the top, the width being generally sufficient to bear the blow of heavy waves, even at a considerable elevation above them. The back slopes of these banks were of pretty much the same kind, because a foreshore was really the portion that received the blow of the sea, and was therefore more likely to be injured. It was here the engineer found the greatest trouble in resisting the opposing force. The third kind of embankment was the stone walling, or the upright wall, which was of all the most difficult of construction. There was a difference of opinion amongst engineers as to the precise form these walls should take. He was just now superintending the construction of a sea-wall nearly a mile long in the Isle of Wight on behalf of the Government. It was a wall to retain the land from being washed away by the sea, and came fairly under the description of lands now being discussed. The difficulty experienced in building this class of wall arose from various causes: there were great risks of being blown up, and the expense altogether was so great that it was only in exceptional cases the method could be resorted to. Another kind of banking was by the sides of rivers where the waves were not very destructive, but where it was quite essential to have a most careful construction to prevent the flood from over-flowing the side lands. This affected the case of rivers in uplands more than the sea. At the entrances to large rivers it was sometimes necessary, although there was no exposure to the sea, to have careful stoning, because the work was frequently tested by heavy seas. In the river Crouch, in Essex, they took great pains to stone the facings, because the stream, though not wide, was deep. The sea washed the banks there in a peculiar way, coming from the German ocean with a sort of cutting side-wave, that probably had a more wearing effect upon the face of the stone than it would have done had it come directly upon it. A railway on the Humber was made in the same way. The stones were placed in the line of the stroke of the sea, in order to save the concussion with the direct face of the stone. This was a very necessary precaution, and it had answered remarkably well. The value of earth walls depended entirely upon the locality. Mr. Shellabear mentioned that sand had been found to be the best substance. He (Mr. Grantham), however, did not agree with this, believing there was a great deal of difficulty attending the working of such a material. Of course, much depended upon the mode in which the faces of the banks were made. A good sodding, in some cases, might be made from the marram mentioned in the paper; and if it could be got to grow in time to save the bank from injury, no doubt it was one of the best protectors it was possible to get. He had been called upon to prepare plans for fencing off some accumulated land in the Humber. The land (an island) had accumulated from the sea; and a wall was built, round which it was proposed to extend further. The sort of sod that had been referred to seemed to be the best adapted for the purpose, and he had no doubt they would be able to place it at a very small slope. A wall had been in construction for some years on the principle of pitching it with stones. In the first place, for the purposes of temporary protection, faggots were used with great advantage. Groins were also used, and they acted well in protecting the foundations from wear and tear. The Morecambe Bay railway might be instanced as a case where a good deal of land was recovered by banks of facing stone and also of groins. He had himself at the present time superintendence of a bank at Fleetwood which had been successful to a certain extent. There were several circumstances of a secondary character that operated in the erection of walls, which, if not properly attended to as minor matters, gave vast trouble, and involved enormous expense. Particularly might be mentioned sluices and culverts for drainage. It was seldom that sluices were put in at sufficient depth; and often the capacity of the drains was not properly regulated. It frequently happened that the sluices were cheaply made, and were merely effective for the moment when the bank was made; afterwards they were sources of perpetual trouble and cost. He himself had, some time since, to repair works of this kind that in the first instance had cost but little, while the repair alone cost £700, simply because of a want of attention and foresight in the original builders. Another question that should not be overlooked was the cost per acre at which these reclamations could be made with profit. Having gone carefully into the question, he was of opinion that, except in the case of extraordinarily good lands, an agriculturist should not go beyond a cost of £20 per acre in making a bank. This might be considered a rather high figure, but he had known it pay in a case of large reclamation. At the same time, he admitted it was a hard thing to quote precise figures; and he had mentioned £20 because he thought that was very likely to be remunerative.

The CHAIRMAN: You mean that £20 per acre would be remunerative for creating land?

Mr. GRANTHAM said that was his meaning, but it must be pretty good land to allow of such a result. It would have to be brought quickly into cultivation, and all the work should be well done, so as to incur as little annual maintenance as possible. Some lands were done at a much cheaper rate, but it was doubtful whether the cheaper was not actually the dearer method. He called the attention of every agriculturist interested in these matters to the recent Act of Parliament, by which a combined system could be established for the purpose of bringing about extensive reclamations. An individual enclosing land would do so at his own cost and risk, but there was no reason why this should be involved. The Commissions of Sewers appointed under the 23rd of Henry VIII. had been continued, and the powers of the act had been increased by the Land Drainage Act of 1861, enabling landowners who were interested in a piece of reclaimable land to combine to execute the work of enclosure, being equally taxed to defray the expenses. His experience of inland rivers had taught him that there was great advantage to be gained by such a union of landowners. He recommended all who felt a concern in the question to look into the Act, and become acquainted with its provisions. The advantage was that in combining in a work of this kind every contributor took his part, not only in the cost, but in the management and benefits to be derived from the prosecution of a work in a systematic way. The Inclosure Commissioners had the sanctioning of this Act, and therefore everything was done in a public manner. The operations of the Act could be carried out without difficulty, and the result would be the improvement of inland rivers, and the reclamation of land from the sea, the latter being, of course, the original intention of the Legislature in the time of Henry VIII. No doubt there were a great many persons having coast lands, and large areas of border, who would be glad to combine to borrow or expend money for their reclamation. The Act to which he had referred would show how this could be done, and the general interests of agriculture would be promoted thereby (cheers).

The PRESIDENT: You did not say what slope you would recommend against the full force of the open sea. In the Humber, which is little more than a tidal river, the same slope of course is not required as in the spot where you have a heavy sea. What slope do you recommend in the case of open water?

Mr. GRANTHAM: It is difficult to speak with precision, but I should say that somewhere about two to one, if well stoned, with some foreshore.

The PRESIDENT: Have you directed your intention to the preservation of banks where they are nearly undermined by the waters, like the river banks in Holland?

Mr. GRANTHAM: I have never had any experience of that description of banks. In some instances, where I have had to deal with land floods, and where the landowners wished it, I have introduced culverts which would let in flood water when they wished to inundate the land. The sluices were self-acting, and occasionally there were hand sluices, too. The sluices were, however, very numerous.

Mr. LAWRENCE said there could be no doubt the Wash was a fruitful school for engineering of the description connected with the reclamation of land, and experience of the most useful character had been acquired there. Sir J. Rennie, Mr. Fowler, and some of the other eminent engineers had attempted too much there, when they endeavoured to grapple with the ocean at once. They struck a line across the estuary of the Wash, and in one instance they spent £14,000 in making a fragment of an embankment which was washed away with a single tide. The quiet processes which were now being followed to reclaim the land were very instructive, and they would probably lead eventually to the saving of that immense tract of land which once had the designation of Victoria County. This could only be done by degrees, and to save any land from the sea it was always necessary to follow the operations of nature slowly. He did not believe in some of the great works that had been undertaken of building large sea walls, and grappling suddenly with a tidal ocean with 26 feet rise and fall. In a sea-girt island like ours, such wonders could not be expected. We must proceed as it were terrace by terrace. The notion that once prevailed in this country, and that led to the expenditure of hundreds of thousands of pounds in the Wash, proved how great were the mistakes made in the reclamation of lands. The drainage of the Fens was one of the greatest works in the country. Even in Holland there was nothing that exceeded the Norfolk estuary for the drainage of highland lying behind the sea. The Norfolk Estuary Company undertook a vast work; but their shares at the present time were only worth a few shillings, and hundreds had been bought at half-a-crown each. The general question of land inclosure closely concerned the society and its supporters, because all agricultural topics were strictly economical questions. The reclamation of land should be encouraged by all practical agriculturists. The mode of making embankments was not a whit more important a subject than it had been described, and equally important was the question of the President as to the undermining of banks by the water. The only thing to do was to give a good foreshore. Of course if the occupiers of land chose to go to more expense they could stone the front of the bank and make an effectual barrier against the sea, as they did in Holland.

Mr. HAWKSHAW said it was impossible to lay down general principles regarding slopes, because so much depended upon material. The sand of the sea-shore made its own slope, and that was six or seven to one. This proved to be an effectual barrier against waves if it was long enough. General principles as to the formation of banks could not, however, be laid down, unless in every instance the nature of the material of which it was formed was given. He could give one piece of information respecting slopes in works of great magnitude. In Holyhead it was found that stone thrown into the sea in deep water gradually assumed three kinds of slopes. At about five feet below the water it was six to one; deeper down it was three to one; and very deep down it was one-and-a-half to one, showing that everything depended upon the force of the water and waves and the kind of material. If the material had been softer the slopes would have been flatter. Neither could general rules be laid down as to where land could be reclaimed. All that could be said was that if the land was worth £30 an acre when reclaimed, not more than £15 or £20 ought to be laid out upon it. If the cost was greater, it was much better to buy land ready made. Slopes covered with soil and sods were, in his opinion, utterly inadequate to resist the sea, unless there were a very large foreshore and shallow water. If the foreshore was flat and very wide, an embankment possessing a slope of two to one was practicable covered with sods. No slope of such a description, however, should be relied upon to resist the action of the sea. In the Mediterranean the French made all their barriers against the sea by blocks of stone of some 20 tons each, which they found stood to a slope of one to one, and if they were a third the size they would be two to one, and so on.

Mr. Frere said the outline of the docks at Algiers was at first concave; but it had been found necessary to abandon that for a convex outline, along which the waves could run.

Mr. Harding said he had had considerable experience of the reclamation of lands during many years' residence at King's Lynn. For twenty years he had had a considerable portion of the fen lands under his control, and had, in the capacity of contractor, executed nearly £200,000 of work. His first undertaking was a sea embankment near Louth. It was at the entrance to the Humber, and there were undoubtedly different slopes there. The first portion of the bank was silt; then they came to a strong clay; and the slope varied from six to one to three to one, according to the position and the manner in which the bank was struck by the tide. On the Norfolk coast, between Cromer and Wells, there was a bank four miles long, and there the slopes were five to one, the material being of clay. In Norfolk and Lincolnshire they saw nothing of stone; for it would not do to go to so great an expense in reclaiming the land for agricultural purposes: £40 per acre would never cover the expense. In 1839, he remembered, Sir John Rennie devised a plan for inclosing several hundred acres of land on the Wisbech river. It was a bold project; the proposition being to make an immense bank, and cut off the whole of the sea. The contract was undertaken for something like £60,000. Every practical man who knew the Fen country said it was impossible to carry it out, because every time there was a spring-tide the large tract of land was covered with water. When the work was partly done it was found that the back water was so great that it was impossible to proceed, and the contractor was ruined. The way to do it would be to run across small embankments, which could be cast up by a tool instead of barrow work. This would divide the work into sections, and largely increase the chances of success, because the area of the waterway was gradually reduced. The land would thus be reclaimed piece by piece. The value of land depended of course a great deal upon what it had cost. Sometimes land could be bought from the sea at two or three pounds per acre. On portions of the Norfolk coast the land was very rich, while on other coasts it was very poor and miserable. On the Essex coast he knew a piece of land that was enclosed; all the coast was impregnated and poisoned by something that came from the oysters, and since the land had been enclosed millions of ant-hills had risen, costing about £3 an acre every year to level them. The grass did not grow till late in the season, and as soon as the hot weather came, the land began to crack. The consequence was that no tenant could pay his rent. In Norfolk it was different, because you got a sufficient quantity of alluvial soil to make the land pay well. Various reasons were given for this richness. His opinion was that the sea had nothing to do with it. There were two sources to which he looked: one was the matter washed out of the drains into the river, and the other was the animalcula deposited. It was possible to achieve great results by judicious enclosure of land. Some time ago he was asked to make a certain embankment; but, as a practical man, he declined. A London engineer in the neighbourhood came forward, and, although he was told the work was impracticable, he said there was no difficulty, and undertook to do it in six weeks, at the moderate cost of between £400 and £600. The gentleman wished to make an earth embankment with brick-bats and faggots, and a wooden tunnel at the bottom. The work went on for 16 weeks, £4,000 was spent, and the first tide that came swept every particle of the bank away. He mentioned this to show that, after all, practical experience was the chief thing to guide those who attempted the reclaiming of lands. A great deal more might be done in improving our rivers. The chief thing was to train rivers: as a rule the back waters were not sufficiently concentrated to scour a deep channel. Faggots, if used, might be placed at a slope of about one to one; and it was astonishing how well they stood. Some gentlemen were great advocates for faggot jetties; but they had a tendency, when the water passed by, of cutting the bank between the jetties. It was better to have no projections, if they could be avoided. In various places where the water pressed hard, piles might be used.

Mr. Holland, M.P., agreed that this was a question of much interest and importance to agriculturists generally, and it was specially valuable to the Society, because it concerned the improvement and cultivation of agriculture in the country. Taking into consideration the fact that our population was increasing every year, that our island did not increase except through these adventitious circumstances and scientific achievements, and that a large area was taken annually from agriculturists for the purpose of building, the discussion of such a subject as this could hardly fail to be of service. Knowing that with a diminished area agriculturists had to multiply their produce to meet the wants of an increasing population, it was necessary to gather all the facts that could be gathered as to the means by which our waste lands might be made serviceable. One or two interesting things had arisen out of the discussion. One was as to the value of silt, and another remark showed how valuable it was in all agricultural matters to apply animal matters to the land for the production of vegetable substance. In reclaiming lands from the sea they were providing additional area, and at the same time a manure to enrich it—things of weighty importance at the present moment. The hon. member concluded by moving a vote of thanks to Mr. Grantham and Mr. Shellabear for their addresses.

Mr. Clayden seconded the motion. He said he was connected with the Norfolk Estuary Company, whose depreciated shares had been mentioned during the discussion, and he begged to state they were not in quite such a bankrupt condition as had been represented. The company was working slowly in the reclamation of land, and they felt assured they should be able in a few years, from the silting-up of the land, to add to the value of the county of Norfolk.

The President put the vote of thanks, extending it to the gentlemen who had assisted in the discussion. He regretted that the attendance was so small, and thought the Council would have again to consider whether it would not be well to alter the hour at which the meetings were held.

The vote of thanks having been carried, and a similar compliment paid to the Chairman, the proceedings terminated.

Monthly Council: Wednesday, May 1, 1867.—Present—Mr. Thompson, president, in the chair; the Duke of Devonshire, the Duke of Rutland, the Earl of Shrewsbury, Lord Berners, Lord Chesham, Lord Tredegar, Lord Vernon, Lord Walsingham, Major-General the Hon. A. N. Hood, Sir J. V. B. Johnstone, Bart., M.P., Sir A. K. Macdonald, Bart., Sir J. Trollope, Bart., M.P., Sir H. Vane, Bart., Sir T. Western, Bart., M.P., Mr. Amos, Mr. Barnett, Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Clive, M.P., Mr. Brandreth Gibbs, Mr. Holland, M.P., Mr. Wren Hoskyns, Mr. Hornsby, Col. Kingscote, M.P., Mr. Milward, Mr. Pain, Mr. Pope, Mr. Randell, Mr. Read, M.P., Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Robert Smith, Mr. Torr, Mr. Turner, Mr. Wallis, Mr. Wells, Major Wilson, Professor Wilson, Mr. Jacob Wilson, Mr. Frere, and Dr. Voelcker.

The following new members were elected:

Bayning, Lady, Honingham Hall, Norwich.
Bennett, Philip, Rougham Hall, Bury St. Edmund's.
Bramwell, Fk. Joseph, 35a, Great George-street, Westminster.
Cook, W. R., Rickinall, Botesdale.
Cranfield, William, Buckden, Huntingdon.
Crewe-Read, Capt., R.N., Llandinam Hall, Montgomeryshire.
Croft, John, Dalton House, Saddington, Market-Harborough.
Denton, Henry, Wolverhampton.
Fair, James, Tabley Villa Farm, Knutsford.
Fison, Joseph, Ipswich.

Griggs, George, Oaklands, Romford.
Hetherington, John Railton, Carleton, Carlisle.
Jefferson, Skelton, Preston House, Whitehaven.
Johnson, B. B., Withersfield, Newmarket.
King, Henry, Bury St. Edmund's.
Lockwood, Rev. Edward J., Belstead, Ipswich.
Mallows, Wm. Jas., Manor House, Beyton, Bury St. Edmund's.
Mason, James, Eynsham Hall, Witney.
Mathew, Edward Windus, Wern, Port Madoc, Carnarvon.
Nunn, Charles, Fornham, Bury St. Edmund's.
Peto, James, Barningham Park, Ixworth.
Pretty, William, Palgrave, Diss.
Riley, John Edward, Elm House, Winkfield, Windsor.
Searle, Malcolm, 2, Bond Court, Walbrook, Middlesex.
Smith, John F., Hill Farm, Glemsford, Sudbury.
Stutter, Arthur, Market Hill, Bury St. Edmund's.
Stutter, John, Oaks Lodge, Queen's Road, Clapham Park, S.
Swinburne, Sir John, Bart., Capheaton, Newcastle-on-Tyne.
Taylor, Edward, Whitton, Leintwardine, Hereford.
Whiting, Thomas Chapman, Barsham, Beccles, Suffolk.
Wright, William, Wollaton, Nottingham.
Yeoman, Robert Charles, Merton, Thetford.
York, J. Neal, Newmarket, Suffolk.

FINANCES.—Major-General the Hon. A. N. Hood presented the report of the Committee, from which it appeared that the secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the society's accountants, and were found correct. The balance in the hands of the bankers on April 30 was £1,680 6s. 8d. Different tenders have been received for the printing of the society's catalogues, the lowest of which is from Messrs. Clowes and Sons, the printers of the society's journal, and it is recommended that their tender be accepted; and a considerable saving will be the result. The Committee have had prepared an account, showing the receipts and expenditure of the society under various heads, and the results of country meetings, inclusive and exclusive of prizes, for twelve years. They recommend that a copy should be sent to each member of Council, and that it be referred to the Journal Committee. This report was adopted.

JOURNAL.—Part I., Vol. III., 2nd series, was laid on the table, and will be delivered to members in the course of next week.

VETERINARY.—Major-General the Hon. A. N. Hood reported that the Committee have received the following letter from Professor Simonds of his visit to Mr. Jordan's farm, near Driffield, to inspect some sheep, pigs, and cattle. The professor reports that they were affected by splenic apoplexy of a peculiar character, inasmuch as the disease was communicated from the sheep to the cattle and pigs.

Royal Veterinary College, March 30, 1867.

Gentlemen,—I have the honour to report that during the month of August last a communication (herewith enclosed, marked No. 1) was received from Mr. F. Jordan, Eastburn House, Driffield, which set forth that a very fatal disease had appeared among his sheep, and that he feared the infection had extended to some beasts and pigs on the farm. Mr. Jordan's letter enclosed one from Mr. Bowman, veterinary surgeon (marked No. 2), in which Mr. Bowman stated that 20 of the sheep had died up to the first day of his attendance, and seven since; and that among other lesions which he observed *post mortem* was a great enlargement of the spleen.

Under these circumstances I deemed it right to visit the farm and institute an inquiry into the nature and causes of the disease. I found that the breeding ewes, 267 in number, had been the first attacked, and that they were still the chief victims of the disease. I further ascertained that they had been kept on the same farm on which they lambed, and that 143 "cull ewes," which had been removed from them to another occupation only eight days before the disease broke out, continued in perfect health.

It further appeared that by bringing the ill sheep into the farm premises the disease had been communicated to the bullocks and pigs, two bullocks having already died out of ten, and five pigs out of nineteen, being all which to this time had been attacked. No doubt could exist that all the animals had succumbed to the same disease—one of those mysterious blood affections, known as splenic apoplexy. The causes of this malady are not well understood, but its pathology would point to the probable entrance of minute organisms—bacteria—into the blood, thus giving rise to chemical changes in that fluid.

It would appear from recent researches that bacteria are the active agencies in producing the putrefaction of manure, &c.; and as the disease had manifested itself while the ewes were being fed on a piece of seeds recently manured on the surface with farm-yard manure, it is not improbable that in this circumstance is to be found an explanation, in part, of the cause of the outbreak.

Splenic apoplexy, like other allied blood diseases, may be said not to admit of cure, and often also the best devised preventive measures will fail, unless carried to the extent of an entire removal of the animals from the place where the malady had originated. In the present instance this course was adopted to as great an extent as the surrounding circumstances would permit, and with the further view of fortifying the systems of the animals against the inroad of the disease antiseptic agents were freely employed. These consisted chiefly in the daily administration of the sulphite of soda in combination with the compound tincture of bark and gentian. In a few days a marked improvement took place, fewer attacks occurred, and they soon ceased entirely.—I am, Gentlemen, your most obedient servant, JAS. B. SIMONDS.

To the Veterinary Committee of the
Royal Agricultural Society.

BURY ST. EDMUND'S MEETING.—Mr. Milward reported that the programme had been settled and would shortly be forwarded to all the members. A payment of £279 10s. on account of forage was recommended to be made to the Steward of Forage. The local press would be permitted to have tents upon the ground, under the orders of the honorary director. The secretary had been instructed to apply to some of the principal clockmakers for the use of a clock for the show-yard, and also for a large bell, to be rung for clearing the show-yard of visitors in the evening. They also recommended that local photographers be permitted to attend, for the purpose of taking portraits of prize animals. This report was adopted. The President, after reporting an interview he had the previous day with the Lord President of the Council, put the question to the meeting, whether, in their opinion, it were desirable that an endeavour should be made to induce the Privy Council to permit the Society to hold a show of cattle at Bury St. Edmund's, when only 7 votes were given in the affirmative.

STEAM CULTIVATION.—The Committee have to report the completion of the task entrusted to them; the peculiarly unfavourable character of the summer and autumn of 1866 has, by protracting the inquiry, somewhat added to its cost, and materially delayed the publication of the report. The Committee have, however, every reason to believe that the work has been thoroughly well done. The reports occupy 330 pages of the *Journal;* and if the cost of their preparation (£180) be considered properly chargeable to the *Journal* expenses, the whole expense of the inquiry will not exceed £692. The Committee express their confident hope that the valuable information thus obtained will be considered an adequate return for the expenses necessarily incurred in its collection.

COMMITTEE OF SELECTION.—1. The Committee have had under consideration the two vacancies in the Council caused by the election of Lord Chesham to be a Trustee and Lord Cathcart to be a Vice-President; and they beg to report that District C, containing 468 members, is represented in the Council by five members only; and District E, containing 424 members, sends four members only to the Council. Mr. Hassall, Shropshire, a large dairy farmer, is recommended in District C, and Mr. Webb, Worcestershire, in District E.

2. *House List of Members of Council to be recom-*

mended to General Meeting.—The consideration of this list not having been included in the duties of the Committee, no suggestions are offered with reference to it. The Committee would be glad to receive the instructions of the Council whether in future years the Committee is expected to furnish similar information with reference to the House List, which it has done in the case of casual vacancies in the Council.

On the motion of the President, in the absence of the Earl of Powis, and seconded by Lord Walsingham, Mr. William Hassell, of Bubney, Whitechurch, Salop, and on the motion of Mr. Randell, seconded by Mr. Pope, Mr. James Webb, of Spring Hill, Fladbury, Pershore, Worcestershire, were unanimously elected Members of Council in the room of the Right Hon. Lord Chesham, elected a Trustee, and the Right Hon. Earl Cathcart, elected a Vice-President.

House List.—Agreeably with the bye-laws the Council arranged by ballot the following election-list, to be recommended by them for adoption at the ensuing General Meeting on the 22nd inst.

ATTENDANCES (FROM THE RISING OF THE PLYMOUTH MEETING IN 1865 TO THE PRESENT TIME).

Names.	Monthly Councils. 14.	Special Councils. 11.	Weekly Councils. 16.	Committees.	
				Number of Meetings.	Attendances.
Acland, Thomas Dyke, M.P., Sprydoncote, Exeter, Devon.	6	4	1	46	18
Barnett, Charles, Stratton Park, Biggleswade, Beds.	5	1	...	27	8
Cantrell, Charles S., Riding Court, Datchet, Bucks.	11	1	...	17	16
Clayden, John, Littlebury, Saffron Walden, Suffolk.	10	2	...	33	25
Dent, John D., M.P., Ribston Hall, Wetherby, Yorkshire.	10	2	3	84	53
Hudson, John, Castleacre Lodge, Swaffham, Norfolk.	2	1	...	1	1
Kingscote, Colonel, M.P., Kingscote, Wootton-under-Edge, Gloucestershire.	10	3	...	3	3
Liddell, Hon. Henry George, M.P., Ravenscroft Castle, Durham.	...	...	...	...	...
Lopes, Sir Massey, Bart., M.P., Maristow, Devon.	4	1	...	18	4
Milward, Richard, Thurgarton Priory, Southwell, Notts.	6	2	...	48	20
Pain, Thomas, Ugford Cottage, Salisbury, Wilts.	9	2	1	13	7
Pope, Edward, Great Toller, Maiden Newton, Dorset.	4	2	1	15	1
Rigden, William, Hove, Brighton, Sussex.	10	1	...	15	2
Stone, Nathaniel Chamberlayne, Ayleston Hall, Leicestershire.	...	...	...	...	...
Torr, William, Aylesby Manor, Great Grimsby, Lincolnshire.	13	1	1	73	62
Turner, George, Brampford Speke, Exeter, Devon.	3	1	1	3	...
Vane, Sir Henry Ralph, Bart. (Elected Nov. 7, 1866), Hutton Hall, Penrith, Cumberland.	...	...	...	...	...
Vernon, Lord, Sudbury, Derby.	8	2	2	55	29
Wallis, Owen, Overstone Grange, Northampton.	5	2	...	60	9
Western, Sir Thomas Burch, Bart., M.P., Felix Hall, Kelvedon, Essex.	6	2	4	...	...
Wilson, Major Fuller Maitland. (Elected Nov. 7, 1866), Stowlangtoft Hall, Bury St. Edmund's, Suffolk.	4	1	...	4	4
Wilson, Jacob, Woodhorn Manor, Morpeth, Northumberland.	13	2	...	64	31
Wilson, Professor John, Iver, Uxbridge, Bucks.	5	1	3	11	2
Wynn, Sir Watkin Williams, Bart., M.P., Wynnstay, Rhuabon, Denbighshire.	3	1	...	...	...

Country Meeting of 1868.—The Report of the Committee appointed to inspect the various sites offered to the Society at Derby, Leicester, and Nottingham, having been read, the Council were favoured by the attendance of deputations from the above towns:—

Derby Deputation.—His Grace the Duke of Devonshire, K.G.; the Right Hon. the Earl of Harrington, the Right Hon. the Earl of Lichfield, the Right Hon. Lord Scarsdale, the Right Hon. Lord Vernon, the Right Hon. Lord Denman, the Marquis of Hartington, M.P.; the Lord George Cavendish, M.P.; the Hon. E. W. K. Coke, Lieutenant-Colonel Wilmot, V.C.; W. T. Cox, Esq., M.P.; M. T. Bass, Esq., M.P., and the mayor of Derby, John Renals, Esq.; the town clerk of Derby, John Gadsby, Esq.; Mr. Alderman Barber, Mr. Alderman Madeley, Mr. Alderman Roe, Mr. Alderman Lingdon, Mr. Councillor F. Forman, the borough surveyor, George Thompson, C.E.; John Hitchman, Esq., M.D., chairman Derbyshire Agricultural Society; John Faulkner, Esq., James Nuttall, Esq., John Coleman, Esq., the secretary of the Derbyshire Agricultural Society, James C. Smith; G. W. Baker, Esq.

Leicester Deputation.—His Grace the Duke of Rutland, lord-lieutenant of the county of Leicester; E. B. Hartopp, Esq., M.P., Dalby Hall, Leicester; John Dore Harris, Esq., M.P., Ratcliffe Hall, Leicester; T. W. Hodges, Esq., mayor of Leicester; Samuel Stone, Esq., town clerk, Leicester; Richard Harris, Esq., J.P. and alderman, Leicester; Samuel Viccars, Esq., J.P., and alderman, Leicester; George Baines, Esq., alderman, Leicester; William Hunt, Esq., J.P., Leicester; Mr. John Crow, Mr. George Harrison, Mr. Charles Harding, Mr. Joseph Swain (town councillors, Leicester); Major Knight, J.P., Glenn Parva Manor House; the Rev. E. Smythies, Hathern; Thomas Allen, Esq., Thurmaston; N. C. Stone, Esq., Aylestone Hall; J. E. Bennett, Esq., Husbands Bosworth Grange; Thomas Willson, Esq., Knaploft Hall; R. H. Chapman, Esq., Upton, Nuneaton; P. P. P. Goodchild, Esq., Glenn Parva Grange; Mr. Thomas Shepherd, Mr. T. A. Wykes (secretaries).

Nottingham Deputation.—W. H. Barrow, Esq., M.P.; T. B. T. Hildyard, Esq., M.P.; Lord Amberley, M.P.; T. J. S. Foljambe, Esq., M.P.; R. Milward, Esq., J.P.; H. A. Smith, Esq., J.P.; W. Sanday, Esq. (Holme Pierrepont); the mayor, J. L. Thackeray, Esq., J.P.; the town clerk, W. Enfield, Esq; G. Beaumont, Esq.; J. Brown, Esq.; F. G. Rawson, Esq.; the corporation surveyor, M. O. Tarbotton, Esq.

These gentlemen having communicated to the Council the fullest local information connected with their respective districts, and having answered satisfactorily the inquiries made of them by the Council, the President expressed to them the best thanks of himself and the Council for their kindness in having attended the meeting that day, and for the deep interest they had evinced in promoting the objects of the Society.

The deputation having withdrawn, the Council proceeded to the consideration of the particular locality best suited, under all circumstances, for holding the country meeting next year; and, after some discussion of the respective advantages of each position to which their attention had been called, it was decided in favour of Leicester by 26 votes, to 6 for Derby, and 2 for Nottingham.

Thursday, May 2: Adjourned Monthly Council.—Mr. Thompson, President in the Chair. Present: His Grace the Duke of Devonshire, K.G., the Earl of Shrewsbury and Talbot, Lord Tredegar, Lord Walsingham, Major-General the Hon. A. N. Hood, the Right Hon. Sir John Trollope, Bart., M.P., Sir Henry Vane, Bart., Mr. Brandreth Gibbs, Mr. Greene, M.P., Mr. Holland, M.P., Mr. C. Wren Hoskyns, Mr. Lawrence, Mr. Randell, Mr. Read, M.P., Mr. Torr, Mr. Wells, Major Wilson, Professor Wilson, Mr. Frere, and Dr. Voelcker.

The report of the Stock Prizes Committee was presented by Lord Walsingham, recommending an addition of £300 for prizes in the Horse Classes, to which £50 was added by the Local Bury Committee. This report was adopted.

A Special Council was subsequently held to determine on the appropriation of the Education Grant of £300 for the year 1867. After a long discussion it was resolved that a candidate for the Society's honours and premiums must produce a satisfactory certificate of having received a good general education, and must be between the ages of 18 and 25. The Society's prizes to be awarded to candidates passing an examination in the Science and Practice of Agriculture, in Book-keeping, and in one or more of the following subjects at the discretion of the Committee, viz., Mechanics in their application to Agriculture, Agricultural Chemistry, Botany, Geology, Veterinary Science, Field Engineering, and Surveying. The examiners to be appointed by the Council. A Committee to carry out this scheme will be nominated at the Monthly Council in June.

THE CONTINUANCE OF CATTLE-PLAGUE, AND ON THE BEST METHOD OF ERADICATING IT.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

LETTER XVI.

MY LORDS,—Since my last letter was published a change of Government has taken place, and consequently a change in the members of the Council Board. As you probably, my lords, never read my former letters, you will, I trust, pardon the allusion to the part I have taken in the attempt to eradicate this fearful pestilence, a recapitulation necessary to the proper understanding of this subject.

As I had for a long time studied the diseases of the lower animals with a view to throw light upon human pathology and treatment, at the outbreak of the cattle-plague I offered my services to the Government to investigate the disease in this or any other country; and in answer to my letter to Sir G. Grey, I was told "that inspectors were appointed by the Privy Council."

After this liberal offer, I determined to study the disease at my own expense, and to publish the result of my investigations, as mentioned in my first letter (*Mark-Lane Express*, September 21st, 1865), sent first in manuscript to your lordships). Although snubbed at first, I was rewarded for all my labours by a request from the Secretary of the Royal Commission that my letter (No. 7), on "Dogs and Disinfectants" should be sent to each member of the Board. The knowledge that my modest lucubrations might receive aristocratic touch and comment was almost too much for me; but I gradually recovered the shock, and proceeded with my researches. The cattle plague, as is well-known, first appeared on or before the 19th June, 1865, at Islington, and was allowed to disseminate itself over the country in all directions, and more than a month after the outbreak we were told in Professor Simonds' Journal (*Veterinarian*, July, p. 22), "That a fatal bovine disease of an uncertain character had appeared."

I will now, my lords, mention the conclusions I came to respecting this disease, and the advice I gave to the Government, with the dates of the letters; next the part taken by our aristocratic rulers in respect to this pestilence; and thirdly, the present state of the cattle plague in this country, its eradication and future prevention.

In my first letter (September 21st, 1865) I advised the stoppage of all movements of cattle and the establishment of dead-meat markets in all our large cities and towns. I beg of your lordships to observe the date of these letters. In my second letter (September 30th) I advocated the establishment, for a short period, of one experimental hospital to test the efficacy of disinfectants and internal medicines; a plan long after resorted to by the Government on so small a scale that it was entirely useless. In my fourth letter (October 30th) I was the first to point out the exanthematous nature of this disease. (Pathological Society, October 17th, 1865), which has little or no resemblance to typhus or typhoid fever, as stated by the Government advisers; that the meat of animals (sheep and oxen) suffering from cattle plague, as shown by experiments upon myself and upon the lower animals, has no injurious effect when used as human food; that sheep, as shown by the report of 27 autopsies made by myself, were liable to cattle plague, and that these animals should not be driven along public roads (October 31st, 1865); that so-called disinfectants are nearly if not altogether useless, and that heat and exposure to the air are the best means of eradicating the poison (December 26th, 1865); that hounds and hunting have been the means of disseminating the disease to a great extent. In my eighth letter (January 8, 1866) I was the first to point out the non-identity of small-pox and cattle plague, and to expose the erroneous inferences of Dr. Murchison; that the only way to eradicate the disease was to kill and compensate, to slaughter all foreign sheep and cattle at the ports of landing, and to keep all store animals in quarantine.

I could add greatly to this list, but I have said enough, I hope, to convince your lordships that I arrived at these conclusions after carefully investigating the disease, and that my opinions are therefore entitled to some attention. I need not again dwell long on the dilatory nature of all the proceedings for the suppression of this murrain. The passiveness of the Royal Agricultural Society; the non-assemblage of Parliament for eight months; the "patient" trusting to local authorities and their divided counsels; the suggestion of the Royal Commissioners that inspectors should not have the right to slaughter; homœopathic delusions and garlic disseminations; the assertion by four members of the House of Commons (February 21st, 1866), that sheep could not be affected with cattle plague; the order to tie up single dogs in Ireland and to allow of their hunting in packs in England: these and many other inconsistencies and short-comings I could, as I have said before, dilate upon; but let me proceed to the practical and more useful part of my letter, viz., Why does cattle-plague exist in this country? and how is it to be got rid of?

The first question, I think, is easily answered: Cases occur from the disturbance of the dormant poison, and the bringing it into active life; but more frequently from the introduction of foreign sheep and cattle from the continent of Europe. According to the last return now before me, during the week ending April 20th, two fresh outbreaks of cattle-plague have occurred in Derby and Lincolnshire; and here, my Lords, let me point to one important omission in these returns, viz., the want of information respecting the origin of this disease. We are told week after week, in a stereotyped form, that a certain number of animals have been attacked, and that a given number in contact with the diseased animals have been killed; but we are left entirely in the dark as to how the disease originated—whether it arose from latent poison, or whether from recent importation. Surely, my Lords, if a competent person were appointed to investigate thoroughly every case, and to report weekly on the supposed cause of the outbreak, it would be a great advantage to the public, and we should be more likely to get rid of the pestilence. In some instances the existence of a latent poison is clear enough; but in others I have reason to believe that the importation of cattle and sheep from the continent has been the means of disseminating the disease. I moreover believe that whilst cattle-plague exists in Holland, Belgium, and other parts of Europe, and whilst the present lax and careless system exists at the ports of landing, we shall never get rid of cattle-plague for any length of time.

At an early period of the outbreak of the disease in this country, I pointed out the impossibility of detection in the early stage, and that an animal (ox or sheep) might infect others without having the disease itself, so that animals coming from infected countries, unless they undergo proper seclusion, will always be liable to import the plague.

According to a recent edict, foreign cattle and sheep may be removed from Harwich to the Metropolitan Cattle Market. But let me allude to a case of recent occurrence, to show the necessity of the public being acquainted with the supposed cause of the outbreaks of cattle-plague that are of such frequent occurrence in various parts of England. As is well known, Mrs. Nicholl's dairy of cows at Islington, where the disease probably first appeared, has lately been visited by the plague. What was the cause of this? Did it arise from latent poison, notwithstanding the free use of so-called disinfectants? or was the disease occasioned by foreign cattle from Holland, Belgium, or other parts of the continent?

These are important questions, and their attempted solution by competent persons would serve to put the owners of cattle on their guard, and might be the means of preventing the spread of the disease. Let me quote another example to show the unextinguishable nature of this poison. Last summer the cattle of Mr. Briggs, Oxcombe, Lincolnshire, were destroyed by plague, or by the order of the Privy Council. In March the manure from these cattle was distributed upon the land, and cattle plague soon appeared on the farm. If to each weekly return such cases as these were reported, with cautions and warnings, surely, my Lords, some good would result?

But how are we to get rid of the plague? It may be absent for weeks, and then again, as in the examples above quoted, be brought out of its recess; or, on the other hand, may be newly imported by our continental neighbours.

My Lords, I am not vain enough to suppose that any word I have written has had the slightest influence upon the proceedings of the Government. Slowly and tardily the stoppage of fairs and markets and the removal of cattle, except under certain restrictions, were prevented, "and the kill and compensation" system adopted, although during this period recoveries were weekly reported; but the slaughtering of animals at the ports of landing, and the establishment of dead-meat markets in large cities and towns, recommended in my first letter, is still opposed by the Government. It will take many more thousand deaths of cattle and sheep from this plague, besides a large mortality from pleuro-pneumonia and small-pox, before such a change can be accomplished.

In conclusion, my Lords, let me urge upon you the necessity, for the present, of preventing all large gatherings of cattle and sheep: "the snake is only scotched, not killed," and it is better to be on the safe side, and not run the risk of bringing it to active and pestilent life. In my next letter I intend touching upon some important matters connected with cattle-plague and other diseases of sheep and oxen.

I am, my lords, yours obediently,

EDWARDS CRISP, M.D.

42, *Beaufort-street, Chelsea, May* 1, 1867.

THE FUNCTIONS OF SMELL AND TASTE IN CATTLE.

In the preceding article it was shown that the functions of smell and taste in cattle were now acknowledged to involve chemical processes, and that between them and the odorous and sapid properties of the grasses and other normal food consumed by our domesticated animals, there existed a very close relation in natural chemistry. The proposal of Linnæus, Boerhaave, and others, to divide the odorous and sapid properties of the vegetable kingdom into some twelve classes, was also examined, and found not to be satisfactory. The proposition of the late Professor Henslow to classify odours and savours according to their chemical qualities affords more hope of ultimate success; but up to the present time organic chemistry has made so little progress in the analytical investigation of proximate principles of this kind, more especially of the odorous and sapid properties of those plants forming the natural food of our cattle, that the subject may not inaptly be said to be identically in the position where Sir Humphrey Davy left it some half a century ago! This is much to be regretted; but farmers are not left without ample consolation, for it was at the same time shown that from time immemorial they have been in the habit of estimating the value of their hay and other feeding materials by a system of chemical analysis more trustworthy than that of any of our agricultural laboratories, and that the chemical senses of smell and taste were capable of being educated in a very high degree.

In our present paper we propose examining the subject from a chemico-medical point of view. Since it is an acknowledged fact, one that has long been established at the bar of practice, that all the odours and savours of the natural food of our cattle possess certain medicinal properties, and since such properties agree with their smell and taste, the INQUIRY naturally follows, *Has this chemico-medicinal relation anything to do with health?* In other words, Is the health of our cattle dependent upon the odorous and sapid properties of their food?

An affirmative answer must undoubtedly be given to this question. Practically speaking, no diversity of opinion can reasonably exist on the matter, for it is confirmed by the experience of all ages, past and present. On certain minor details, upon which discovery is wanting to establish truth, farmers may differ; but the general conclusion they support by the difference of value they themselves unanimously put upon their hay and other produce, such values being entirely dependent upon, or regulated by the quantity and quality of active medicinal properties which feeding materials possess. Thus, rich in these, they are of high value: deficient of them, they are the reverse.

So far as chemistry has ascertained, those proximate principles distinguished as odorous and sapid in the food of our cattle, and naturally relished by them, are normal elements of food. They are essentially necessary to health, because they enter into the structure of the body as a characteristic portion of the constituents of which it is formed. Thus a single tissue of the body cannot be formed without sulphur, whose medicinal properties are well known. And if nitrogenous elements cannot be assimilated without so important a medicine as sulphur (and such is an established fact that cannot be gainsaid), what is the general conclusion to be deduced relative to the function which medicinal principles perform in the dietary of ourselves, no less than in that of our cattle? The very same thing may be said of the compounds of iron, common salt, and the other proximate principles comprising the odorous and sapid properties of feeding materials, when their quality is natural to the smell and taste of animals.

We may as well, therefore, in this place, discard from the mind of the reader, where such exists, an erroneous notion, now being assiduously taught, and that too commonly prevails, viz., "*medicine is only required when animals are in bad health!*" But those who advance such fallacious dogmas evidently know nothing, chemically speaking, about the proximate principles in question; much less do they understand, medically speaking, what is the medical function they (normal odours and savours) perform in the dietary of our cattle. Their own conduct in disseminating erroneous doctrines of this kind is doubtless to whitewash themselves and the untenable position they are at present allowed to occupy as amateur professors of practical scientific agriculture. Now, as such fallacious doctrines are doing an incalculable amount of harm, by directing the progress of discovery from its legitimate channel, *experimental inquiry*, we have come to the above conclusion, that this is a more fitting place than the end of our paper (which is the usual one) for a refutation of them.

What, then, is the fallacious doctrine and practice thus taught, when reduced to its simplest form? and what is the practical method of dealing with those pseudo-teachers who are (unwittingly, it may be) embracing every opportunity of disseminating their dietetic dogmas on the feeding of cattle, for purposes too apparent not to be plainly seen by all who are qualified to investigate any agricultural topic at the Bar of Experimental Inquiry?

Both these topics may be satisfactorily disposed of in a single sentence. For example, the doctrine thus unwittingly taught is, that "a brisk dose of medicine, say jalap, will not operate unless a person is in bad health ; and the experimental part of the refutation is to drench those pseudo-teachers very briskly with jalap, or some more active medicine, until *the facts of the case* thoroughly satisfy them that the very reverse of what they blindly teach is true.

More generally speaking, the pseudo-doctrine and practiec taught may be refuted thus : The compounds of sulphur, iron, common salt, &c., &c., &c., medicinal principles which we have seen are contained in the normal food of cattle, and are essentially necessary to the formation of the body, cannot be so utilized unless animals are in bad health ! ! We might expose the ridiculous absurdity of the doctrine and practice thus taught by innumerable arguments of the above kind, were it necessary ; but as it would be wasting time and space to reason with minds so obtuse as not to perceive the truth of the contrary doctrine and practice—viz., that certain medicinal principles are absolutely required to preserve animals in health —we shall proceed to investigate the inquiry as to the number of proximate principles in the natural food of cattle possessing medicinal properties, and what the medicinal function of those substances really are, so far as understood in practical and scientific agriculture.

In organic chemistry, the vast majority of the odours and sapid properties of both the vegetable and animal kingdoms are not yet known, while the plants eaten by cattle and the flesh they yield for our tables may possess substances that are known, were processes discovered by which indefinitely small quantities of them could be detected. Progress, however, continues to be slowly but surely made in both these branches of chemistry, as has already been stated ; and it is more than probable that the two questions of cattle condiment and of animal health, including man and beast, now raised and being thoroughly discussed by physiologists, will stimulate further analytical researches with increased vigour, so that the general public may soon be placed in a position to trace more clearly the chemico-medical relation that exists between the two, the odorous and sapid properties of the food of our cattle, and the odorous and sapid properties of the milk and flesh they yield as food for ourselves, and how much the health of man and beast are dependent on these two classes of proximate principles.

The conclusion thus arrived at is deduced from the following data. It is, for example, an established law that the Vegetable Kingdom organizes food for the Animal Kingdom. Now, when the facts are borne in mind that the odorous and sapid properties of the former communicate to the latter a special flavour and dietetic value—that the flesh of animals fed on comparatively inodorous and tasteless food loses much of its natural flavour and nourishing properties—and that a sacrifice of health is sustained in both the animal and vegetable kingdoms—it is difficult not to arrive at the conclusion that under such circumstances the function of smell and taste in man, as well as in the lower animals, and the general design of the GREAT CREATOR relative to the organization of the odorous and sapid properties, animal and vegetable, and to the medicinal functions which such properties possess and perform in nature, is all but manifest, and also the line of experimental inquiry which farmers are called upon to pursue in the investigation of practical and scientific truth.

Thus much will readily be granted. Still, there remains, at the same time, a chemical hiatus that cannot be filled up satisfactorily, in accordance with the established rules of practice, until the necessary discoveries are made. When, for example, an indefinite number of proximate principles are thus unknown on both sides of the general question—viz., in the plants eaten by cattle on the one hand, and in the milk and flesh they yield on the other, and when these are principally of an odorous and sapid character, it is difficult to say with any degree of certainty how those substances are formed which are known, or what is the peculiar chemico-medicinal purpose they serve in the animal economy.

Two examples—one from the vegetable kingdom and the other from the animal world—will best illustrate this and the course of experimental inquiry to be taken, in order to arrive at tangible conclusions.

First.—In vegetables we see certain proximate principles which have been isolated ; but the chemical manipulation or details of the process in the natural laboratory by which such substances are found cannot, with any degree of certainty, be known until the other proximate principles not known are discovered. The reason of this is manifest ; for the chemical nature of a substance must be known before its chemical function in the natural laboratory can be determined. Thus, in the grasses and plants eaten by cattle, the following substances have been found—viz., gluten, starch, sugar, tan, tannic, gallic, citric, acetic, tartaric, phosphoric, and other vegetable acids ; certain pure bitter principles, as that of gentian (a nitrogenous alkaloid) ; and saline substances, as the salts of soda, potash, lime, magnesia, sulphur, iron, &c. Now, the conclusion has been arrived at that the first of these (gluten and other nitrogenous substances of this class) must be formed from ammonia or those manurial substances that form the nitrogenous food of plants, and such may be received in a very limited sense, just as the prattling of children is received before they have learned to speak. But when we come to investigate a subject at the bar of experimental inquiry, guessing what children mean is wholly excluded ; for, before a chemist can arrive at such a conclusion in such a place, he must first exemplify the natural process, by producing artificially-made gluten from such manures. And what is true of gluten is also applicable to the other substances referred to, with hardly an exception.

Second.—Again, of the long list of animal substances to be found enumerated in works on Animal Chemistry, we may instance in this place muscular, gelatinous, and nervous tissue ; bone, fat, &c., &c. Now, in common conversation, farmers have learned to talk of flesh-forming, bone-forming, fat-forming, and respiratory substances, in speaking of the peculiar function which certain substances in the feeding materials given to cattle perform in the natural laboratory, and so long as such dicta are only meant as a very rough guess at the facts of the case they may be tolerated, however contrary to the established rules of Practice with Science ; but when brought to the bar of experimental inquiry, such dicta cannot be listened to, being highly empyrical and even objectionable, because contrary to scientific and practical truth.

When brought to the bar of experiment for examination, the subject divides itself into no fewer than five separate and distinct practices, with the corresponding number of scientific branches ; and the error into which practical farmers are now allowing themselves to be led by the pseudo-teachers of experimental agriculture, is to jumble all these several practices together, and then to treat the compound as a monster hybrid by the mystifying Rule of Three—viz., pounds, shillings, and pence ! Those who thus handle practical people's purse-strings require to be sharply looked after ; and the following remarks on the several practices just alluded to—viz., 1, the practice of the plant in converting its food into its organism ; 2, the practice of the chemist in analyzing the plant ; 3, the practice of the farmer in feeding his cattle ; 4, the practice of cattle in converting plants into flesh ; and, 5, the practice of the chemist in analyzing flesh—will enable the reader to do so, although not much conversant with chemistry, farming, and physiology.

1. The first of these practices belongs to vegetable physiology, and will be found ably discussed in the writings of the late Professor Henslow, previously quoted, and other vegetable physiologists. As Henslow very justly observes, in his "Descriptive and Physiological Botany," "It would be an unnecessary waste of words to offer any proof that plants are organized bodies endowed with life." "What life is, whether it is a simple quality, the effects of which are variously modified, according to the nature of the tissue in which it resides, and by means of which it acts, or whether it possesses several distinct properties, which are severally capable of acting only upon and through particular tissues, is quite unknown to us." This is the plain truth, candidly told by one who lived an ornament to his time and profession, and who divides the functions of Nutrition into seven distinct processes, viz. 1, absorption ; 2, progression of sap ; 3, exhalation ; 4, respiration ; 5, retrogression of proper juice ; 6, secretion ; 7, assimilation. But in all these processes much remains to be discovered before anything practically can be deduced relative to chemical and medidinal details. At the same time he instances common salt as "a stimulus necessary for the preservation of health in plants." And with these general conclusions most physiological writers agree.

2. The proximate analyses of grasses, and the other vegetable substances comprised in the natural dietary of cattle, is the second practice. It is, in many respects, the very reverse of the last one, for the work consists of pulling to pieces the organized materials which the plant in its lifetime built up into a living structure. The grouping system as now pursued by our agricultural chemists is fallacious, and highly objectionable in a professional light; for before proximate principles can be grouped as they now are, they ought first to be ascertained: and as the latter has not yet been done, the former consequently is practising an unpardonable imposition upon the public; while to receive such erroneous and dogmatical combinations of substances, the greater number of which is unquestionably not known, is, on the part of the agricultural public, checking the progress of discovery in this most important branch of chemistry. If agricultural chemists would only confine their reports to their own practice, their conduct might be tolerated, however far behind their practice may be; but not one word in these reports is said about their own practice. Were we employed to report on the culture and growth of carrots, *and well paid for it*, and then to give in an essay on the manufacture of caudle! Epsom salts!! or soda-water!!! the transaction would not be a bit further from the motto "Practice with Science," or more ridiculously absurd and foreign to the purpose, than are many of the so-called reports and lectures on agricultural chemistry now being disseminated. Reports and lectures on practical chemistry are very much wanted by the great body of agriculturists. To those who know nothing of the subject professionally in the laboratory, such would, no doubt, appear very dry and dull matter; but there is a ten times greater difficulty to get over than this, for not one in twenty (we speak a long way within bounds) is qualified to report practically the analyses of vegetable substances in a laboratory. How can it be otherwise, since the large majority of the proximate principles are not known, and since these chiefly consist of odorous and sapid properties, so liable to be dissippted in the atmosphere, and to undergo changes of which nothing is known?

3. We now come to the farmer's practice, and we should like if some of our practical readers would draw our attention to a single report where the practice of feeding a horse, an ox, a sheep, or a pig was given. To state in long bewildering columns how much by weight or measure of this and the next thing has been given to the pigs, or whatever the kind of stock may be, is not expounding practice. The professional secret lies deeper than this. Two farmers may give equal quantities of feeding materials of the same or equal quality, and yet the two practices may be totally different. Daily experience is familiar with examples of this kind; and if our pseudo-teachers and their patrons are not aware how ridiculous their reports are to practical men capable of appreciating physical truths when honestly laid before them, and the harm such fallacious dogmas are doing, by leading blind "know-nothing-gentlemen" like themselves astray, it is about time that both teachers and taught were made sensible of their true and not very honourable position.

4. Our fourth practice is that of our cattle—the manufacture of beef, mutton, and pork. The question, or process, is one in animal physiology, and, like the first in vegetable physiology, it is as yet more a matter of inquiry than of established rule. Few branches of science are, at the present time, enjoying a greater share of popular attention than this. In agricultural works hardly a word has yet, however, been mooted on the subject of those differences that exist between animals as to how greater or less weights are accounted for by natural laws. As we shall have to go more into this matter in another article, we shall only add at present that our amateur teachers should bear in mind that it is the pig that makes the pork, not they, and that they have not yet told us how the pig performs its practice.

5. The fifth practice is one in animal chemistry. We know that beef, mutton, and pork differ from each other by our chemical senses—smell and taste; but in our agricultural laboratories animal chemistry is even further behind than vegetable chemistry.

In the preceding pages it has been shown that the organs of smell and taste in cattle have been denominated chemical senses, because the impression made upon them by odorous and sapid properties involve chemical processes. It is also admitted that the odorous and sapid properties of their food must be relished, or communicate an agreeable impression through the olfactory and gustatory nerves to the sensorium, before they will eat it; so that the conclusion is manifest that such properties have a chemical function to perform in the natural laboratory in the several processes of digestion, assimilation, and secretion. It has also been shown that from time immemorial practical farmers have been accustomed to judge of the value of their hay and other feeding stuffs by a system of natural chemistry similar to that which cattle instinctively practise in the selection of their food—viz., smell and taste; that both organs are capable of education, so as to become as sensitive and discriminating as the corresponding organs of the lower animals; that some farmers are much better judges of quality than others; and that much of the success of feeding stock depends upon the knowledge possessed in this much-neglected branch of chemistry. And, lastly, it has been shown that the odorous and sapid properties of the natural food of cattle have a medicinal function to perform, so that the relation which exists between the organs of smell and taste in cattle and the odorous and sapid properties of their food is a *chemico-medicinal* one.

But while cattle select plants because they yield certain proximate principles contained in the *materia medica*, they reject others that possess medicinal properties. Indeed, so far as the extent of chemical analysis will enable us to judge, the vast majority of medicines are rejected when animals are in good health, and only a few select articles chosen, because they enter into the structure of the living organism, or perform some catalytic or dialytic function in the digestive, assimilating, and excretory processes, about which nothing, comparatively speaking, is yet known.

What then (1) is the *chemico-medicinal* function performed by the several odorous and sapid properties of the natural food of cattle? (2). What are those maladies to which cattle are subject when their food is deficient of such properties, and when the organs of smell and taste do not receive the normal supply of their natural stimuli? (3). What is the pecuniary value of such properties? (4). And can deficiencies be profitably supplied from other resources of the vegetable kingdom?

Such are the principal questions suggested by the above data, deduced from the facts of the case involved in the inquiry, so far as they are known. Unfortunately, however, for the inquiry, only a few of the facts of the case are known, while the terms "osmazome," "catalytic," "dialytic," "protein compounds," "flesh-forming, fat-forming, bone-forming, and respiratory substances," now used by agricultural chemists, are only so many professional expressions purposely put forth to cover ignorance, or hide the facts of the case under the scientific bushel of sounding names—facts which farmers require to know, and consequently the subject requires to be examined in the broad daylight of experimental truth, so to speak.

The object of this series of papers being to stimulate experimental inquiry, by means of smell and taste, in all examples where chemical analysis in the artificial laboratory fails, so as to lead to the discovery of the facts thus hid under the scientific bushel, the more admissible course in examining the above interrogatories will be that of experiment or example. Thus—

1. As to the chemico-medicinal question. Sulphur is known in medicine to be laxative, and a stimulating diaphoretic; iron is tonic, diuretic, &c.; common salt tonic, anthelmintic, aperient, and antiseptic; sugar aperient, antiseptic; the vegetable acids are generally tonic, cooling, and antiseptic; tannin tonic, astringent, antiseptic; bitter principle tonic, antiseptic, stomachic; most of the odorous properties of the plants relished by cattle are stimulating, carminative, antiseptic, diaphoretic, and, as a class, affect the nervous system.

2. The maladies to which cattle are subject when their food is deficient of such substances, are anemia, atrophy, dropsy, worms, inflammatory complaints, skin diseases, a relaxed or costive state of the bowels; in short, just those maladies for which experience in the good olden time taught our simple forefathers to use such odorous and sapid properties—properties which consequently have acquired the professional designation of medicines.

This is brief, but we hope sufficient to show the practical reader the chain of inquiry that leads to an experimental knowledge of the chemico-medicinal relation that exists between the organs of smell and taste in cattle and the odorous and sapid properties of their food.

Before noticing the third and fourth questions, let us examine the first and second somewhat more closely from a chemical point of view. Since, in the first place, some farmers make a better use of their chemical senses than do others, because they have paid more attention to the cultivation of the natural talents they thus possess in common with the lower animals, but in a less degree of perfection, owing to neglect of such functions; and since, in the second place, because cooks and tea and spirit tasters have from time immemorial been considered good or bad judges of meat and other articles of dietary, according as their organs of smell and taste possessed a high or low degree of discrimination, or, in popular phraseology, according as they could make a good or bad use of the nose and palate, the question of inquiry that naturally follows is obviously this: Can any progress be made in this important branch of natural chemistry?

To this an affirmative answer must unquestionably be given; and for the purpose of stimulating the progress of inquiry by means of the organs of sense, let us examine the following questions in a chemical light.

1. What are the odorous and sapid properties that produce the brownish-black-red of the rich juicy lean meat of oxen and sheep, when fed on the natural food produced by some of our most fertile and down pastures, ycleped by chemists osmazome, but by our best cooks "*black gravy*"?

2. Why is black gravy more abundant in old animals than young?

3. What makes the florid red flesh of the meadow-fed meat in summers when there is an absence of the normal supply of light?

4. What makes the pale, insipid flesh of animals, when fed on the etiolated herbage of the water meadow, attended with dropsy? or, under the oilcake-obese system, attended with atrophy of muscle, but a hypertrophy of unhealthy, inferior fat?

1. As to the darker colour and larger quantity of osmazome, along with those ascertained substances, as lactic acid, phosphoric acid, inosinic acid, lactate and phosphate of potash, chloride of potassium, and other salts of the first example, the solution of the problem appears to turn upon the following data, viz.: There being a normal supply of available iron, tannin, gallic acid, sulphur, &c., in the food of the animal and in the juice of its flesh, we have all the chemical conditions necessary to account for the practical solution of the question of a dark colour. And such properties appear to reside in the juice, as if required to preserve in health the tissues by their tonic, antiseptic, and diaphoretic action; for when deprived of such colouring matter by washing, the tissues are white; and when deficient of such in a living state, they are devoid of health—as will be shown under the fourth head. If an extra supply of iron, tannin, bitter-principle, &c., is taken into the system, the flesh will become blacker in a corresponding degree, and often bitter to the taste. The other odorous and sapid properties, when taken into the system in excess, also communicate their respective colours, smells, and tastes. Thus, when animals are fed exclusively on oak-mast, which contains a large per-centage of phosphoric acid, it and its compounds may be detected in the meat. Thyme, marjoram, mints, garlic, &c., furnish other examples. When beef, mutton, and pork contain such substances in excess, we can detect their presence by smell and taste; but when the normal supply of them is only taken into the system, the digestion and assimilating processes appear to be more perfectly performed in the natural laboratory, the odorous and sapid properties of the meat thus formed being of a richer and finer quality; those of the vegetable kingdom ceasing to be distinguished in those of the animal kingdom. The presence of the former, however, is not less certain on that account, although under new combinations their individuality is in a great measure lost. In point of fact, the contrary is true; for the more perfect the changes that take place, and the less the quantity of crude matter that remains unworked up into such new combinations, the finer is the quality of the meat and the more palatable and valuable in a dietetic sense.

2. The presence of a larger amount of osmazome in the flesh of old animals than in that of young, both grazing on the same grounds, is, perhaps, more a physiological question than a chemical one. The problem has long engaged the attention of practical men, and appears to hinge upom the following data:—In early life, parts are growing while they are differently constituted, as it were. Thus, the proportion of the different kinds of building materials used in the construction of the various organs of the body, as bone and tissue, are different at these tw periods of life; consequently, the economy of organic manipulation and materials used up must also be different. There may be a similarity in the process of growth; but this is not exactly the question at issue, such having reference to a difference in the per-centage of certain substances present in the juice of the flesh, known only as odorous and sapid properties, and distinguished only by the scientific designation of "osmazome"—a Greek derivative, which translated into plain English means "*the smell of broth.*" Now, although there exists as yet some diversity of opinion as to the formation of the muscular, gelatinous, and nervous tissues, and the source from whence their respective elements are directly derived, there is none as to the large proportion of fibro-gelatinous matter in the flesh, bones, ligaments, serous membranes, &c., of young animals; consequently, if there is a larger per-centage of the one, there must of necessity be a less per-centage of the other; while it is probable that in age a larger amount of tonic, antiseptic, and other like properties present, are necessary to the preservation of vitality and the excretory processes from the skin, &c.

3. Our next question has reference to the florid red colour of the flesh of oxen and sheep when fed on the luxuriant herbage of meadows. The juice of the beef and mutton is thinner, being deficient of albuminous, as well as the odorous and sapid matter known as osmazome. It appears to derive a sufficiency of ferruginous element from the vegetable kingdom; but a deficiency of those tonic, astringent, and antiseptic properties that strike a dark black brown colour with iron, and preserve albuminous matter in its normal healthy state in water at the temperature of the body. The rapidly-grown meadow-grass, so thick and close as to exclude the action of light, is always less or more etiolated, and deficient of odorous and sapid properties; and so is the beef and mutton, into which it is converted.

4. The rotten mutton produced by water-meadows or wet seasons, and the extra fat meat of Christmas, are practical illustrations of our last question. Very little requires to be said about either; for as the food consumed is deficient of odorous and sapid properties of a normal character, so is the flesh produced from it, while there is evidently a larger per-centage of crude matter along with water present than is compatible with health, so that cause and effect appear manifest.

There is, however, another class of maladies produced by improper food, between which the cause and effect are not so easily traced as in the above examples. We allude to certain inflammatory complaints and unhealthy conditions of the skin, bowels, &c., when the food of cattle is deficient of the normal supply of odorous and sapid properties, or contains others of an abnormal character. Thus, if stock are fed upon badly-harvested hay and straw, their bowels get wrong, their coats become dry and staring, and their skins what is termed "hide-bound;" while the muscular and nervous tissues lose their contractile powers and tone. If, on the contrary, the animals had been fed on the grass before it was thus made into hay, they would have thriven, and increased in weight. A similar relation exists between inflammatory complaints and food. It is a well-authenticated fact that the vast majority of maladies to which mankind are subject are traceable to an improper diet, and the same may be said of cattle when artificially fed. One or two systems is therefore wanted—either a perpetual summer and continuous supplying natural food for our cattle, or else a system of supplying natural deficiencies by artificial means. In our climate, the former is impossible; so that farmers are left the alternative of improving the practice they now pursue in harvesting produce, and supplying from other resources of the vegetable kingdom those odorous and sapid properties of which such produce is deficient—odorous and sapid properties relished by cattle, because they are naturally relished by their organs of smell and taste, and are essentially necessary no less to their health than to our own.

This brings as to the last two topics proposed for investigation, viz.: *Thirdly*, What is the pecuniary value of the odorous and sapid properties of the natural food of cattle? and, *fourthly*, Can deficiencies be profitably obtained from the vegetable kingdom?

No satisfactory answer, we fear, can as yet be given to the former of these questions. It has been shown from the writings of Arthur Young, that he put a very high value upon the odorous and sapid properties of hay and other kinds of fodder. We have also done so too, and so have all successful breeders and feeders of stock whose writings we have consulted, or with whom we have personally discussed the matter. But the conclusions thus arrived at are of so general a character as not to afford a definite answer to the question. It is one of those problems that is not easily investigated experimentally, owing to the little attention that has hitherto been paid to the functions of taste and smell in cattle, and the odorous and sapid properties natural to the chemical senses, or that are relished by them. We know, for example, from experience, when hay has a fine rich smell it will be relished by animals; but we do not know whether such a combination of odours and savours forms the best and most profitable combination that can be given. We are familiar with the fact that when cattle are at grass they care very little about the best quality of hay; and the finer the quality of the pastures, and the richer the herbage is of odorous and sapid properties, the more animals require to be pinched before they will lay hold on the hay. They may take a mouthful or two readily, but this is not proof practical. In short, when we enter upon details, very little is known about them individually, less perhaps than was known by our forefathers of the last century. At the same time, it is not to be understood from this that the knowledge of the last century has altogether been thrown away upon the present, for many practical farmers are familiar with many plants that are naturally relished by their cattle, although they may not know much of the pecuniary values of the odorous and sapid properties they possess, or the chemico-medicinal relation that exists between them and the organs of smell and taste.

With regard to the last question, there cannot be a doubt but that a very great deficiency of such properties exists in the food of cattle, and that such can be profitably supplied from the vegetable kingdom. Thus, many of the barks of trees, as elm, birch, ash, willow, &c., are rich in a large number of those odorous and sapid properties relished by cattle, and are, in point of fact, greedily eaten by them, although the combination is not natural. There are, again, a great many other plants—as furze, mugworts, &c., that could purposely be grown on terms that would make the supply cheap and highly-remunerating as feeding material, were it ground into meal for mixing in a dry state, or pulped in a green state along with dry fodder, so as to be thoroughly incorporated with articles deficient of such properties, in order thereby to bring the whole food up to the natural standard. Numerous experiments of this kind have from time to time been made, and with the utmost success in every case where an approximation to the natural quality of food was attained. There is nothing new in the proposition thus enunciated. If we have introduced it in a somewhat new dress, such has purposely been done to stimulate experimental inquiry in its general prosecution and introduction to practice, under the firm conviction, based upon a long period of close observation and successful practice, that such odorous and sapid materials form a far more profitable source of feeding stuffs than oilcake and refuse of this kind, because they have this to recommend them, that the properties they supply are natural and unlimited in quantity. Given alone to cattle as they were in the olden time is objectionable, for an excess either proves aperient or diuretic, or if taken in extra quantity in the system, milk and flesh tastes bitter, &c.; but if the supply is no more than natural, the quality of milk and flesh is improved, for reasons already given, under meat rich in black gravy. W. B.

THE SHORTHORN SALES.

THE PRESTON HALL HERD.

Upon one consideration, at any rate, it was good that the Grand Duchesses should come so soon again into the market. The Shorthorn sales have gone so badly of late that an alarm was gradually spreading as to the palmy days having passed away, and the offer of this fancy tribe was consequently opportune enough. For some time back there has been a deal of anxiety manifest as to how far former prices might be recovered, and sheer curiosity no doubt prompted the attendance of many who thronged into Kent on May Day. The advertisement, however, as a matter of business, was, so to speak, a very genuine announcement, as it was but too well known that every lot must and would be disposed of for whatever it would fetch, and a guarantee of this kind will always go a great way. Beyond such an inducement, the extraordinary sum given by Mr. Betts not two years since for a few Duchesses was itself an attraction, the more especially as the biddings in '65 were taken in town, whilst the animals themselves were far away off in the country. The fixture, in fact, was a challenge to the connoisseurs, and most men with a leaning in this direction contrived to be present. An unusually important Council meeting in Hanover-square certainly kept away some of "the Swells," and it was remarkable that not a nobleman showed up, although, as will be gathered from the price-list, such distinguished breeders as the Duke of Devonshire, Lord Spencer, and one or two more, were well represented by their agents. The names of the several buyers must be otherwise left to tell of a company from which it would be idle or even invidious to make a selection. At one turn you encountered Mr. Caird, and at another Culshaw with his arm in a sling, but jealous as ever of the fame of the Butterflies. Here was Mr. Booth, bound to be looking on; and there Mr. Wythes, game enough to try his hand at another good beginning. One customer hailed from the wilds of Wales, and another from next door, within a mile or two of Maidstone; but it was noticeable there was not a foreigner, nor a colonist amongst the purchasers, or even the bidders. A stranger, said to be from Australia, stood at the right hand of the auctioneer; but as he never seemed to venture on an offer, the credit of this high average is confined to the old country. It has been different ere now, when our American cousins, more particularly, have left their mark so deep.

With an early "Special" at their service, visitors were busy betimes about the Preston Hall homestead; but the preliminary inspection was not altogether satisfactory. It is seldom, in truth, that anything like so famous a herd has been exhibited in such indifferent condition. The stock had pretty generally a feverish forced appearance, with many of them bad, and bare in their coats, and others poor in their touch, and patchy in their flesh. Then, again, the Duchesses had not developed their breeding properties in their new home; for instead of roaming at will over the hill-side of the beautiful park grounds, they had been boxed up at the farm below; as the management would seem to have gone very much on the argument that highly-bred animals must be cultivated after the fashion of hot-house plants. Of a tawny red in colour, with a sweet mild expression, just such as a cow should have, the Duchesses are especially distinguishable by their heads, as they have altogether a "grand" stylish character, that when in proper form must, at the first glance, stamp their repute. But some of them were here all to pieces, the Dowager Duchesses more especially, and although you would pass this or that as "a fine old cow," it was not until you knew of her descent that you lingered over her; while a contemporary in a preliminary notice tells us the following sad tale of the fate of the Duchesses during their brief sojourn in Kent:—"The Grand Duchesses have been peculiarly unfortunate since their migration to Preston Hall. The Thirteenth and Fourteenth died, it was said, from the use of undecorticated cotton-cake; the Seventh was understood to be barren when Mr. Betts bought her; and so she proved, and was fed off for the butcher; and the Tenth and Twelfth were both killed by the bull in the act of being served by him. With regard to the ten females now composing the family, three are too young to breed; three have bred lately; Grand Duchess the Fifth (Lot 1) was bulled on the first of this month; the Ninth unfortunately slipped a heifer calf by Fourth Grand Duke last autumn, and is just bulled; the Fifteenth, nearly four years old, has not yet bred; and the Eighteenth was bulled in September, and will be due to calve on the 15th of June. *One* of the lot is certainly in calf. As bearing upon the *fertility* of the tribe, it seems but fair to add, that Grand Duchess 5th, since she came to Preston Hall, bred a dead bull by Imperial Oxford, and a bull by Fourth Duke of Thorndale, which, being wrongly presented, was destroyed in the act of parturition; and that the first calf from Grand Duchess 11th made its appearance before tho proper time, and lived only a few days. These calves swell the list of the produce, and also that of the misfortunes of the ducal race." Their pedigrees, in a word, sold the Duchesses at Preston; as, whether for appearance or use, we should question very gravely if they were ever previously presented to so little advantage. They may do better again elsewhere, particularly with Captain Oliver, who secured the two grandest of the Grands, and who has already the material to keep up the strain in its pristine purity. But for really good looks and proof, substance and symmetry, there was nothing to compare with the Moss, Red, and Thorndale Roses. There was old Red Rose herself, still all wealth and use; Red Rose the 2nd, comparatively given away at the price if she be not barren; Red Rose the 3rd, another beauty, but a little hard in her touch; and Moss Rose 2nd, a lengthy promising calf, that will sustain the honours of a family which is sure to see a better day. The Butterflies, on the contrary, are clearly going back; at any rate, as tested by this sample, being light, leggy, and flashy, though the Colonel may do better with them when he gets them home again, as he is going to try with Butterfly's Duchess, which sold for 320 guineas, vice 500 guineas, her previous purchase price. The Fawsleys were another queer lot; scarcely worth keeping to their own sort, but upon which a cross might tell; and True Love, a good square heifer, a deal the best of the Lady Loves and Loveys, that do not throw back as they should to their ancestry. We may speak to some of the others as we come across them, although it is by no means our purpose to put up every lot over again, or to record the sensations and cross-fires as "the glass runs."

With such a crush of people, it was of course impossible to entertain everyone at the same time; but it would surely have been better to have served luncheon by relays, than to have had a company at bay for an hour or so, waiting and scuffling for seats like the applicants at a soup kitchen. Then this business was terribly prolonged, instead of being short, sharp, and decisive; although, to show how much the speeches on these occasions are appreciated, a well-known breeder and "Royal" judge of Shorthorns told us that he always goes for a seat near a door, so that he may get out when he has had his lunch and the talking begins. Mr. John Clayden presided, and the day fortunately holding up, Mr. Strafford got to business a little after two o'clock.

The first lot in was Grand Duchess 5th, one of the three Graces that made 1,900 gs. at Willis' Rooms; following by Moss Rose, a particularly good stylish cow, though also getting into years. Grand Duchess 8th was another of the 1,900 gs. lot; but she is fading fast, and very bad in her thighs. Passion Flower is a screw, dear at any price, and Lady Louisa but little better. Grand Duchess 9th was in the 1,300 gs. lot in London, but beyond her head she has little or none of the family tracings; and Grand Duchess 11th was in the 1,200 gs. trio when last sold. Rose of Raby is a sweet cow, if a little delicate, but with length and depth and quality to recommend her; while Pale Face is a very bad one to the eye, and Maidenhair might be crossed into something better hereafter. To the merits of the two Red Roses we have already spoken, and Grand Duchess 15th, one of three sold for 1,800 gs.! has turned out a blank; so that Mr. Miller now got her as a forlorn hope for 80 gs., with the view of trying what the air of the Cardiganshire Hills may do to restore her productive powers. But Mr. Miller went further than this, and matched his Duchess with Royal Wharfdale, a three-year-old bull, that has as much vulgarity and as little symmetry as we ever saw developed in any high-bred animal. Beautiful Butterfly, a three-year-old heifer, fell from 150 gs., at which figure she came to Preston, to 61 gs.; and Mr. Parkyn, or whoever he may be, also secured Countess, a queer-headed, doubtful breeder, at even less money. Nymphalian and Passion Flower 4th are both as mean-looking as they well can be; and with a couple more of no appearance we came to the picked Duchesses, which were to make more than anything and win the wagers that set the top price at over 700 gs. Grand Duchess 17th was in the 1,800 gs. lot of '65, and the pair were really fine stylish cows, though, we repeat, in anything but show form. Either, however, exceeded the limit, with the Duke of Devonshire, Lord Spencer, and Lord Penrhyn as Captain Oliver's chief opponents in running up the pair. The Maid of Lorn was the next likely one, and a very pretty cheap heifer she is to Mr. Whitworth, of the Rifle celebrity, who is carefully but not extravagantly laying the foundation of a Shorthorn herd. Royal Butterfly Duchess 2nd was the best of her sort, and she is to compete with the Devons in the West, while Mr. Pulley, the next customer in the list, is going in for Shorthorns in Herefordshire—all of which sounds very like high treason. Mr. Dawson, a manufacturer, as we believe, from Otley, in Yorkshire though unable to attend the sale, was determined to have a Duchess, and sent in a blank cheque accordingly, which being filled in for 700 gs., obtained for him at all points about the best of them in the yearling Grand Duchess 19th. Frida at 47 gs., with good hair and flesh and a famous top, should be a bargain but for her dark nose; and Lord Braybroke's Thorndale Rose 2nd promises to be a far better animal than her dam—the worst Rose in the catalogue. Two more Grand Duchesses, calves at a few weeks or days old, made respectively 430 gs. and 350 gs.; but we should go all for the higher-priced one, bound for Althorp; and with some of the family handy at Towcester, as the old bull Grand Duke 4th accompanies the little Duchess, Mr. More on the part of Lord Radnor stopping sooner than he should have done for the best-looking bull of the catalogue. The males, however, were not equal to the females; as, of the others, Grand Duke 16th has great style and wonderful quality; Cambridge Duke is very massive, but with plain upright shoulders; and Royal Cambridge 2nd is just a neatish young one. Conrad and Hengist on the contrary, so far as looks went, would not have sold in a fair; and the greatest general average ever known depended mainly, if not entirely, upon hereditary influences, often enough pulled down rather than supported by personal appearance.

The general average for a sale of so large a calibre was, at somewhere about £180 10s. a lot, the best ever known; the two next, that of Lord Ducie in 1853, and that of the Collings further back, reaching no higher than £151 and £151 4s. per head. The twelve Duchesses, however, when sold at Willis' Rooms made £6,510, or £542 10s. each; whereas thirteen Duchesses now made £5,659 10s., or £435 7s. each, above a hundred each less than they fetched not two years since.

The sale went well, though a hesitation at times to give the names of the buyers caused a strong expression of disapprobation. At the meeting in Willis' Rooms, it will be remembered that Mr. Betts' purchases were in the first instances booked to Mr. Brown, Mr. Green, and so on; but as no possible good, but rather the reverse, can come of such "mystification," we see no reason to countenance the practice, and we were glad to notice at Havering, the next day, that the names of the different buyers were cheerfully and readily announced.

COWS AND HEIFERS.

Grand Duchess 5th, red (calved April 23, 1858); by Prince Imperial (15095), out of Grand Duchess 2nd by Grand Duke (10284).—Duke of Devonshire, 200 gs.

Moss Rose, roan (calved July 2, 1858): by Marmaduke (14987), out of Cambridge Rose 6th by 3rd Duke of York (10166).—Mr. Davies (Mere), 230 gs.

Lady Butterfly, red (calved December 12, 1858); by Great Mogul (14651), out of Red Butterfly by Master Butterfly (13311).—Mr. Attenborough, 145 gs.

Grand Duchess 8th, red (calved March 12th, 1859); by Prince Imperial (15095), out of Grand Duchess 2nd by Grand Duke (10284).—Lord Penrhyn, 550 gs.

Red Rose, red (calved May 5, 1859); by Marmaduke (14897), out of The Beauty by Puritan (9523).—Mr. C. Leney, 330 gs.

Passion Flower, roan (calved June 4, 1859); by Homer (16277), out of Pastime by Bashaw (12449).—Mr. Stunt, 45 gs.

Lady Louisa, roan (calved October 4, 1859); by Archduke 2nd (15588), out of Lucy Long by Duke of Glo'ster (11382).—Mr. C. Leney, 80 gs.

Grand Duchess 9th, red roan (calved December 28, 1859); by Grand Duke 3rd (16182), out of Grand Duchess 4th by Cherry Duke (12589).—Mr. F. Leney, 210 gs.

Archduchess, roan (calved January 13, 1860); by Duke of Argyll (11375), out of Baroness by Master Goldschmidt (13315).—Mr. Campbell, 57 gs.

Lady Love, roan (calved September 23, 1860); by Cock of the Walk (15782), out of Looey by Marmaduke (14897).—Mr. Barnes, 70 gs.

Grand Duchess 11th, roan (calved January 5, 1861); by Grand Duke 3rd (16182), out of Grand Duchess 4th by Cherry Duke (12589).—Lord Spencer, 400 gs.

Royal Butterfly's Duchess, roan (calved March 1, 1861); by Royal Butterfly (16862), out of Roan Duchess 2nd by Frederick (11489).—Colonel Towneley, 320 gs.

Rose of Raby, red (calved September 2, 1861); by Lumley (16478), out of Peace by Second Grand Duke (12961).—Duke of Devonshire, 105 gs.

Pale Face, red and white (calved January 1, 1862); by Gondomar (17985), out of Prima Donna by Glo'ster's Grand Duke (12949).—Mr. C. Leney, 42 gs.

Maidenhair, roan, (calved July 1, 1862); by Mocassin (18406), out of Cornbind by Janizary (8175).—Mr. F. Leney, 80 gs.

Thorndale Rose, roan (calved April 3, 1862); by Fourth Duke of Thorndale (17750), out of Cambridge Rose 6th by 3rd Duke of York (10166).—Lord Braybrooke, 355 gs.

Passion Flower 3rd, roan (calved March 30, 1863); by Fourth Duke of Thorndale (17750), out of Passion Flower by Homer (16277).—Mr. Pulley, 105 gs.

Red Rose 2nd, red (calved February 27, 1863); by Englishman (19701), out of Red Rose by Marmaduke (14897).—Mr. Stone, 82 gs.

Red Rose 3rd, red and white (calved February 27, 1863); by Englishman (19701), out of Red Rose by Marmaduke (14897).—Mr. C. Leney, 150 gs.

Grand Duchess 15th, red and white (calved May 28, 1863); by Imperial Oxford (18084), out of Grand Duchess 10th by Grand Duke 3rd (16182).—Mr. Miller, 80 gs.

Beautiful Butterfly, roan (calved May 29, 1863); by Royal Butterfly 10th (18761), out of Roan Knight's Pride by Roan Knight (15167).—Mr. Parkyn, 61 gs.

Countess, white (calved May 29, 1863); by Fourth Duke of Thorndale (17750), out of Prima Donna by Glo'ster's Grand Duke (12749).—Mr. Parkyn, 56 gs.

Nymphalin, roan (calved September 18, 1863); by Bull's Run (19368), out of Sylphide by Sarawak (15238).—Mr. J. K. Fowler, 48 gs.

Passion Flower 4th, white (calved January 26, 1864); by Sixth Duke of Airdrie (19602), out of Passion Flower 2nd by Gondomar (17985).—Mr. C. Leney, 60 gs.

Equity, red (calved April 30, 1864); by Chief Justice (19444), out of Lady Louisa by Archduke 2nd (15588).—Mr. Whitworth, 70 gs.

Preston Butterfly, red roan (calved February 13, 1864); by Sixth Duke of Airdrie (19602), out of Lady Butterfly by Great Mogul (14651).—Mr. Allsopp, 87 gs.

Grand Duchess 17th, red and white (calved September 16, 1864); by Imperial Oxford (18084), out of Grand Duchess 10th by Grand Duke 3rd (16182).—Captain Oliver, 850 gs.

Grand Duchess 18th, red (calved September 16, 1864); by Imperial Oxford (18084), out of Grand Duchess 9th by Grand Duke 3rd (16182).—Captain Oliver, 710 gs.

True Love, roan (calved March 2, 1865); by Third Duke of Thorndale (17749), out of Lady Love by Cock of the Walk (15782).—Mr. Z. Walker, 125 gs.

Lady Lucy, white (calved March 16, 1865); by Third Duke of Thorndale (17749), out of Lady Louisa by Archduke 2nd (15588).—Mr. Meakin, 51 gs.

Beatrice, red and white (calved March 17, 1865); by Third Duke of Thorndale (17749), out of Pale Face by Gondomar (17985).—Mr. Fawcett, 48 gs.

Maid of Lorn, roan (calved August 11, 1865); by Sixth Duke of Airdrie (19602), out of Rose of Raby by Lumley (16478).—Mr. Whitworth, 86 gs.

Red Rose 4th, red with a little white (calved April 30, 1865); by Grand Duke 4th (19874), out of Red Rose 2nd by Englishman (19701).—Mr. Brogden, 240gs.

Thorndale Maid, red (calved August 11, 1865); by Third Duke of Thorndale (17749), out of Passion Flower 3rd by Fourth Duke of Thorndale (17750).—Mr. Allsopp, 71gs.

Royal Butterfly's Duchess 2nd, red (calved Nov. 13, 1865); by Grand Duke 4th (19874), out of Royal Butterfly's Duchess by Royal Butterfly (16862).—Mr Bulteel, 300gs.

Gulnare, roan (calved Dec. 28, 1865); by Sixth Duke of Airdrie (19602), out of Passion Flower by Homer (16277).—Mr. Pulley, 60gs.

Lady Knightley, roan (calved Feb. 13, 1866); by Sixth Duke of Airdrie (19602), out of Maidenhair by Mocassin (18406).—Mr. Adcock, 90gs.

Lady Butterfly 2nd, red (calved March 17, 1866); by Sixth Duke of Airdrie (19602), out of Lady Butterfly by Great Mogul (14651).—Mr. Eastwood, 80gs.

Archduchess 3rd, red and white (calved April 2, 1866); by Imperial Oxford (18084), out of Archduchess by Duke of Argyll (11375).—Mr. J. Fawcett, 52gs.

Grand Duchess 19th, red (calved April 3, 1866); by Imperial Oxford (18084), out of Grand Duchess 9th by Grand Duke 3rd (16182).—Mr. C. H. Dawson, 700gs.

White Butterfly, white (calved Sept. 14, 1866); by King of the Roses (22043), out of Preston Butterfly by Sixth Duke of Airdrie (19602).—Mr. Parkyn, 38gs.

Frida, roan (calved Aug. 9, 1866); by King of the Roses (22043), out of Equity by Chief Justice (19444).—Mr. Whitworth, 47gs.

Oxford Rose, red (calved Sept. 28, 1866); by Imperial Oxford (18084), out of Rose of Raby by Lumley (16478).—Duke of Devonshire, 50gs.

Moss Rose 2nd, white (calved Jan. 19, 1867); by Fourth Duke of Thorndale (17750), out of Moss Rose by Marmaduke (14897).—Mr. Foster, 160gs.

Royal Butterfly's Duchess 3rd, red and white (calved Jan. 21, 1867); by Fourth Duke of Thorndale (17750), out of Royal Butterfly's Duchess, by Royal Butterfly (16862).—Mr. Bulteel, 200gs.

Hilda, roan (calved Jan. 23, 1867); by King of the Roses

(22043), out of Pale Face by Gondomar (17985).—Mr. Friend, 17gs.

Lady Knightley 2nd, roan (calved Feb. 10, 1867); by Grand Duke 4th (19874), out of Maidenhair by Mocassin (18406).—Mr. Adcock, 48gs.

Thorndale Rose 2nd, red (calved Feb. 4, 1867); by Grand Duke 4th (19874), out of Thorndale Rose by Fourth Duke of Thorndale (17750).—Lord Braybrooke, 200gs.

Grand Duchess 20th, red (calved March 10, 1867); by Fourth Duke of Thorndale (17750), out of Grand Duchess 8th by Prince Imperial (15095).—Lord Spencer, 430gs.

Archduchess 4th, red (calved March 10, 1867); by Grand Duke 4th (19874), out of Archduchess by Duke of Argyll (11375).—Mr. Campbell, 41gs.

Grand Duchess 21st, red and white (calved March 15, 1867); by Baron Oxford, out of Grand Duchess 17th by Imperial Oxford (18084).—Mr. McIntosh, 330gs.

Passion Flower 5th (calved April 28, 1867).—Mr. Bates, 20 gs.

BULLS.

Grand Duke 4th (19874), red (calved April 25, 1861), by Grand Duke 3rd (16182), out of Grand Duchess 8th, by Prince Imperial (15095).—Lord Spencer, 210 gs.

Lord Oxford 2nd (20215), white (calved November 8, 1861), by Fourth Duke of Thorndale (17750), out of Oxford 13th, by Third Duke of York (10166).—Mr. F. Leney, 200 gs.

Royal Wharfdale (22805), red and white (calved August 31, 1864), by Duke of Wharfdale (19648), out of Royal Butterfly's Duchess, by Royal Butterfly (16862).—Mr. Miller, 100 gs.

Grand Duke 16th, red (calved July 10, 1865), by Imperial Oxford (18084), out of Grand Duchess 8th, by Prince Imperial (15095).—Mr. A. J. Robarts, 510 gs.

Cambridge Duke 3rd, red (calved October 26, 1865), by Grand Duke 4th (19874), out of Red Rose, by Marmaduke (14897).—Mr. C. Leney, 210 gs.

Mameluke, roan (calved February 2, 1866), by Sixth Duke of Airdrie (19602), out of Lady Louisa, by Archduke 2nd (15588).—Mr. Allsopp, 66 gs.

Conrad, white (calved October 20, 1866), by King of the Roses (22043), out of Nymphalin, by Bull's Run (19368).—Mr. Pomeroy, 22 gs.

Grand Duke 17th, roan (calved May 4, 1866), by Second Duke of Wharfdale (19649), out of Grand Duchess 12th, by Imperial Oxford (18084).—Mr. Brogden, 305 gs.

Royal Cambridge 2nd, roan (calved November 3, 1866), by Fourth Duke of Thorndale (17750), out of Red Rose 3rd, by Englishman (19701).—Mr. Mace, 90 gs.

Grand Duke 18th, red and white (calved January 7, 1867), by Fourth Duke of Thorndale (17750), out of Grand Duchess 11th, by Grand Duke 3rd (16182).—*Dead.*

Hengist, roan (calved February 1, 1867), by Fourth Duke of Thorndale (17750), out of Lady Love, by Cock of the Walk (15782).—Mr. Webb, 32 gs.

Royal Thorndale, roan (calved February 24, 1867), by Fourth Duke of Thorndale (17750), out of Lady Butterfly, by Great Mogul (14651).—Mr. Roper, 50 gs.

SALE OF THE HAVERING PARK HERD.

Curiously enough the second day's sale of Shorthorns embraced not only a deal of the same blood, but the herd had also been got together as much or more for amusement than as a matter of business. Like Mr. Betts, the Brasses and the Petos, Mr. McIntosh is well-known as a railway contractor, while he has given his leisure to the *Herd Book,* and certainly with no unprofitable results from such a study. Taken by one or two particular strains, the Havering Herd might not be quite so fashionable just at present as some of the Preston Hall lots; but the difference in other important respects was all in favour of Essex. No contrast, indeed, could be greater than that between the overdone, feverish-looking animals that the thousands travelled down to inspect on the Wednesday, and the blooming, lively, *naturally*-reared stock that a few hundreds of the more select class of visitors went in for on the Thursday. In truth, the Havering Shorthorns would seem to be not merely better reared and (judiciously) cared for, but even better bred for points, as far away the best looking one of the two catalogues was to be found at the Clock House farm. However much "the premises" might have been previously considered, the look round had a very palpable effect, as people felt they could give a bidding without doing this, on the off chance of the lot either breeding or dying. Moreover there was pedigree to back such essential qualifications, with a good sprinkling of the Oxfords, the Barringtons, the Waterloos, the Charmers, and so forth.

With many anxious to get home again, less "grace" was given than usual, although the conduct of the sale was not altogether commendable. When once a lot is put in, the biddings should go on, the quicker, nine times in ten, the better. Of course it is all fair to call attention to a nice cross, or "them" shoulders, but an interim conversation is a serious interruption, and there was at one period, as a consequence, a rather awkward dispute, as to whether an animal had been knocked down for *fifty* or *sixty!* So great was the waste in this way, that *Time* was repeatedly called from the sides of the ring, and the best of the young bulls had to be put up out of turn, in order to catch customers who would otherwise have been off.

The sale opened rather slowly with some old cows, and seven or eight lots were knocked down before a hundred had been reached. Still Coquelicot is of a rare good sort, and Fawsley Garland a great cow, with a capital coat, but not so good in her flesh. Lady Sale, again, is very handsome, and having worn well looked to be dirt cheap at forty-odd; while the second Garland, with a bit of Booth in her, is clearly all the better for the cross. She is especially good in her fore-quarter, and only a little vulgar in her colour. The Waterloo, which was the first to top the two figures, did so very deservedly, as she has great depth and substance, and is altogether of the right sort; but Lady Valiant, who cleared the side rails and another fence in fine style, has not much beyond her "Grand National" abilities to recommend her. The Archduchess of Cambridge is a nice cow enough, full of Bates' character; but the Charmer lacks substance, while Lady Bates 3rd has both use and fashion in her favour. Wellingtonia is another of nice style; but the white Wellingtonia, with plenty of size, is but a plain one at the price, particularly when contrasted with the next lot in. This was all over a prize cow, and there was quite a murmur of admiration as Mr. Strafford read over her pedigree and performances. Lady Oxford 5th by Third Duke of Thorndale, out of Lady Oxford 4th, took the first prizes as a yearling at Witham and Worcester, when we at once proclaimed her extraordinary excellence, and heralded in Essex the Royal honours she would also achieve. And she has been going on admirably ever since, as she is indeed now very near upon perfection. With a sweet head and generally fine feminine character, she has rich flesh, a good coat, and extraordinary breadth and depth. If Lady Oxford *has* a fault, it is that her frame "set" a little too early, as she has scarcely size enough to emphasize her otherwise marvellous merits. But she proves in other ways as well as she does to the eye and the hand, with two of her produce also in the catalogue. The elder of these, Baron Oxford, a lengthy straight two-year-old, with a hard touch and no hair, made 500 guineas from Colonel Towneley; and a yearling, Baron Oxford 2nd, as good in these respects as his half-brother is bad, brought another 500 from Mr. Holland's agent, who was pretty generally thought to have the pick of the pair. Thus the dam and her two sons realised 1,600 gs. Another of the Valiants had not much good about her, and Princess, "a maiden" heifer, went of course for anything as a butcher's beast. Mildred, with a nice coat, good flesh, and ragged hips, was by no means a dear lot, while Fawsley was chiefly remarkable as a white, set off by a black nose. Princess, another prize-taker, has size and depth; and Lady Oxford 6th was hurried out of the ring as soon as she was in it, as according to the conditions her owner "retained the right of placing a reserve" upon her as being of "a somewhat doubtful character," whatever that might happen to mean. She may not be a breeder, or may be of such extraordinary excellence as to warrant the exception hereafter; although we did not quite see this. With fine fore-quarters and good flesh she is coarse in her character, and is further pulled down by a bad, disagreeable head and expression. Fawsley the 2nd, narrow and delicate, with bad loins, was dear at any price; but Charmer 2nd is a very nice one; and Blue Bell, so pretty and well-crossed in her pedigree, would seem to be worth far more than she made. The two next Fawsleys were wonderfully on the improvement, as the market-prices show, and another Lady Bates made good money. With her the plums were picked out, until we came to yet another Fawsley, a very sweet heifer-calf, for which Mr. Bulteel went as high as two hundred.

With two young Oxford bulls the chief interest evaporated; and, the yearling being brought in after his big brother, the company evaporated also, the remaining business being left pretty much to "our own reporters" and the scramblers for a few chance lots. Amongst these Mr. Moore did about the best for Lord Radnor, when he gave a hundred for Fawsley Baronet, a young bull with famous flesh and hair, standing on a short leg; whereas Grand Duke of Essex is high, and bad behind the shoulder, with a coarse horn and plain head; so that even his pedigree could not sell him. But there was nothing to complain of on the average, which reached to something over £119 each for fifty-five lots—ample encouragement for Mr. M'Intosh to begin again, as it is said he will do, by building a new place at the Clock-house.

COWS AND HEIFERS.

Blue Bell, red (calved March 16, 1854), by Major (13284), out of Bellevillina, by Belleville (6778).—Mr. Burchnall, 39 gs.

Coquelicot, red (calved July 6, 1855), by Duke of Cambridge (12742), out of Blouzelind, by Earl of Dublin (10178).—Mr. F. Sartoris, 61 gs.

Fawsley Garland, roan (calved August 26, 1856), by Earl of Dublin (10178), out of Garland, by Grey Friar (9172).—Sir G. Phillips, 80 gs.

Lady Sale, roan (calved March 20, 1857), by Old Rowley (15020), out of Lady Coke, by Jethro Tull (11616).—Mr. Tunnicliffe, 42 gs.

Lady Bates 2nd, roan (calved March 21, 1857), by The Buck (13836), out of Lady Bates, by Duke of Glo'ster (11382).—Mr. Bromett, 68 gs.

Fawsley Garland 2nd, red and white (calved July 18, 1857), by Vanguard (10994), out of Garland, by Grey Friar (9172). Mr. Barton, 35 gs.

Miss Oxford, red (calved January 8, 1859), by Sixth Duke of Oxford (12765), out of Miss Nightingale, by Humphrey Clinker (13055).—Mr. Pulley, 61 gs.

Waterloo 24th, roan (calved January 26, 1859), by Grand Duke 3rd (16182), out of Waterloo 19th, by Second Grand Duke (12961).—Mr. Z. Walker, 105 gs.

Lady Valiant 2nd, red and white (calved April 4, 1859), by Young Major (18311), out of Lady Valiant, by Lord Havering (11724).—Messrs. Gaitskell, 40 gs.

Archduchess of Cambridge, red and white (calved November 6, 1859), by Archduke 2nd (15588), out of Coquelicot, by Duke of Cambridge (12742).—Mr. E. J. Clayden, 77 gs.

Princess Alice, red roan (calved December 14, 1859), by Sixth Duke of Oxford (12765), out of Princess 4th, by The Baronet (10918).—Mr. G. Barton, 62 gs.

Charmer, roan (calved May 12, 1861), by Mainstay (16490), out of Sunset, by Mameluke (13289).—Mr. H. Moore, 80 gs.

Lady Bates 3rd, roan (calved June 6, 1861), by Fourth Duke of Oxford (11387), out of Lady Bates 2nd, by The Buck (13836).—Mr. Slye, 155 gs.

Lady Valiant 3rd, red and white (calved April 15, 1862), by Third Duke of Thorndale (17749), out of Lady Valiant 2nd, by Young Major (13311).—Mr. Whitworth, 40 gs.

Wellingtonia, roan (calved May 5, 1862), by Third Duke of Thorndale (17749), out of Waterloo 24th, by Grand Duke 3rd (16182).—Mr. Davies, 120 gs.

Wellingtonia 2nd, white (calved June 7, 1862), by Third Duke of Thorndale (17749), out of Waterloo 16th, by Duke of Bolton (12738).—Duke of Devonshire 160 gs.

Lady Oxford 5th, roan (calved July 29, 1862), by Third Duke of Thorndale (17749), out of Lady Oxford 4th, by Second Grand Duke (12961).—Duke of Devonshire, 600 gs.

Lady Valiant 4th, red and white (calved July 27, 1863), by Third Duke of Thorndale (17749), out of Lady Valiant 2nd, by Young Major (18311).—Mr. Whitworth, 70 gs.

Princess, roan (calved February 20, 1863), by Third Duke of Thorndale (17749), out of Lady Sale, by Old Rowley (15020).—Mr. Norrey, 40 gs.

Mildred, roan (calved May 13, 1863), by Prince Alfred (13494), out of Magnolia, by Majestic (13279).—Mr. Whitworth, 68 gs.

Fawsley, white (calved December 22, 1863), by Third Duke of Thorndale (17749), out of Fawsley Garland, by Earl of Dublin (10178).—Sir G. Phillips, 51 gs.

Wellingtonia 3rd, red and white (calved January 3, 1864), by Cherry Duke 3rd (15763), out of Waterloo 23rd, by Prince Imperial (15095).—Mr. Marshall, 56 gs.

Princess 2nd, red and white (calved June 13, 1864), by Third Duke of Thorndale (17749), out of Lady Sale, by Old Rowley (15020).—Mr. J. P. Foster, 83 gs.

Lady Oxford 6th, white, with roan ears (calved September 20, 1864), by Third Duke of Thorndale (17749), out of Lady Oxford 4th, by Second Grand Duke (12961).—*Withdrawn.*

Fawsley 2nd, roan (calved November 24, 1864), by Third Duke of Thorndale (17749), out of Fawsley Garland 2nd, by Vanguard (10994).—Mr. Christy, 50 gs.

Wellingtonia 4th, roan (calved January 9, 1865), by Grand Duke 4th (19874), out of Waterloo 16th, by Duke of Bolton 12738).—Mr. Sartoris, 110 gs.

Charmer 2nd, roan (calved January 16, 1865), by Grand Duke 4th (19874), out of Charmer, by Mainstay (16490).—Mr. Adcock, 170 gs.

Blue Bell 5th, red (calved January 27, 1865), by Grand Duke 4th (19874), out of Blue Bell, by Major (13284).—Mr. Whitworth, 80 gs.

Fawsley 3rd, red and white (calved January 31, 1865), by Grand Duke 4th (19874), out of Coquelicot, by Duke of Cambridge (12742).—Mr. F. Leney, 190 gs.

Fawsley 4th, red and white (calved March 4, 1865), by Grand Duke 4th (19874), out of Archduchess of Cambridge, by Archduke 2nd (15588).—Mr. C. Howard, 270 gs.

Wellingtonia 5th, roan (calved March 1, 1865), by Grand Duke 4th (19874), out of Wellingtonia 2nd, by 3rd Duke of Thorndale (17749.—Mr. Whitworth, 140 gs.

Lady Bates 5th, red and white (calved March 18, 1865), by Duke of Geneva (19614), out of Lady Bates, by Fourth Duke of Oxford (11387).—Mr. L. Walker, 205 gs.

Lady Valiant 5th, red (calved March 27, 1865), by Grand Duke 4th (19874), out of Lady Valiant, by Lord Havering (11724).—Mr. Sheldon, 115 gs.

Charmer 3rd, roan (calved December 2, 1865), by Grand Duke 4th (19874), out of Charmer, by Mainstay (16490).—Mr. Thompson, 98 gs.

Wellingtonia 6th, red and white (calved December 19, 1865, by Grand Duke 4th (19874), out of Wellingtonia, by Third Duke of Thorndale (17749).—Mr. Whitworth, 125 gs.

Fawsley 5th, red (calved January 9, 1866), by Grand Duke 4th (19874), out of Coquelicot, by Duke of Cambridge (12742).—Mr. Bulteel, 100 gs.

Lady Valiant 6th, red and white (calved January 13, 1866), by Grand Duke 4th (19874), out of Lady Valiant 3rd, by Third Duke of Thorndale (17742).—Mr. Whitworth, 57 gs.

Mildred 2nd, red and white, calved January 16, 1866), by Grand Duke 4th (19874), out of Mildred, by Prince Alfred (13494).—Mr. Whitworth, 58 gs.

Lady Valiant 7th, red and white (calved February 14, 1866), by Grand Duke 4th (19874), out of Lady Valiant 4th, by Third Duke of Thorndale (17749).—Mr. Whitworth, 56 gs.

Blue Bell 6th, red (calved April 19, 1866), by Grand Duke 4th (19874), out of Blue Bell, by Major (13284).—Mr. Dickers, 36 gs.

Fawsley 6th, red with a little white (calved August 2, 1866), by Grand Duke 4th (19874), out of Archduchess of Cambridge, by Archduke 2nd (15588).—Mr. Bulteel, 200 gs.

Charmer 4th, red (calved October 28, 1866), by Grand Duke 4th (19874), out of Charmer, by Mainstay (16490).—Mr. F. Wythes, 42 gs.

Wellingtonia 7th, roan (calved December 2, 1866), by Grand Duke 4th (19874), out of Wellingtonia, by Third Duke of Thorndale (17749).—Lord Penrhyn, 120 gs.

Fawsley 7th, red with a little white (calved December 8, 1866), by Grand Duke 4th (19874), out of Coquelicot, by Duke of Cambridge (12742).—Mr. C. Howard, 68 gs.

Princess 3rd, roan (calved December 12, 1866) by Fawsley Baronet (lot 3), out of Princess 2nd, by Third Duke of Thorndale (17749).—Mr. J. P. Foster, 71 gs.

A heifer calf.—Mr. Wainman, 37 gs.

BULLS.

Baron Oxford, red (calved April 14, 1865), by Duke of Geneva (19614), out of Lady Oxford 5th, by Third Duke of Thorndale (17749).—Colonel Towneley, 500 gs.

Grand Duke of Essex 2nd, roan (calved August 2, 1864), by Third Duke of Thorndale (17749), out of Lady Bates 2nd, by The Buck (13836).—Mr. Betts (Holbech), 73 gs.

Fawsley Baronet, roan (calved February 20, 1865), by Grand Duke 4th (19874), out of Fawsley Garland, by Earl of Dublin (10178).—Lord Radnor, 100 gs.

Fawsley Hero, red and white (calved December 3, 1865), by Grand Duke 4th (19874), out of Fawsley Garland 2nd, by Vanguard (10994).—Mr. Leadbeater, 40 gs.

General Napier, roan (calved December 10, 1865), by Grand Duke 4th (19874), out of Lady Sale, by Old Rowley (15020).—Mr. Cheney, 80 gs.

Wellington 4th, roan (calved January 27, 1866), by Grand Duke 4th (19874), out of Wellingtonia 2nd, by Third Duke of Thorndale (17749).—Mr. Tetley, 115 gs.

Grand Duke of Essex 3rd, red and white (calved February 17, 1866), by Grand Duke 4th (19874), out of Lady Bates 2nd, by The Buck (13836).—Mr. Munn, 80 gs.

Royal Prince 4th, roan (calved April 9, 1866), by Grand Duke 4th (19874), out of Princess Alice, by Sixth Duke of Oxford (12765).—Mr. W. F. Harvey, 41 gs.

Grand Duke of Essex 4th, roan (calved May 2, 1866), by Grand Duke 4th (19874), out of Lady Bates 3rd, by Fourth Duke of Oxford (11387).—Mr. Davies, 170 gs.

Baron Oxford 2nd, red and white (calved May 14, 1866), by Grand Duke 4th (19874), out of Lady Oxford 5th, by Third Duke of Thorndale (17749).—Mr. E. Holland, M.P., 500 gs.

Wellington 5th, roan (calved January 1, 1867), by Grand Duke 4th (19874), out of Wellingtonia 2nd, by Third Duke of Thorndale (17749)—*dead.*

SALE OF THE FENCOTE HERD OF HEREFORDS.—Messrs. Russell and Son recently brought under the hammer the stock of Mr. Gregg, of Fencote, who is retiring from agricultural pursuits. The breeding cows and calves reached to No. 68 in the catalogue, and for several lots very good figures were obtained, among which were Endall Beauty, by Colossus (591), 21½ guineas; Pigeon the Third, by Pirate, 27 guineas; Fairmaid the Fifth, one of the Monaughty cows, by Wellington (1112), 46 guineas; Mountain Maid, by Fencote (1989), 21½ guineas; Pretty Maid, by the same sire as the last lot, 28½ guineas; her bull calf, by Counseller, 16 guineas; Daisy, another Fencote cow, 32½ guineas; Moorend, by Hotspur (1279), 21 guineas; Adelaide, by Benbow (1511), 31½ guineas; Young Downton, also by Benbow, 23 guineas; Woodpigeon, by Fencote, 23 guineas; Countess, by a bull by Carlisle (923), 30½ guineas; Lucy, by Counsellor (1939), 21 guineas; Primrose, by the same sire, 24 guineas; Starlight, by Fencote, 24½ guineas; Peeress, by Baron Grove (2402), 37½ guineas; Tidy, by Zonarite (2364), 23 guineas. The stock bull Counsellor (1939), calved Jan. 24, 1860 (bred by and the property of Mr. P. Turner, of The Leen), by Bertram (1513), dam Countess by Silurian (1064), fell for the sum of 48 guineas; and a ten-months' old bull calf (bred by and the property of Mr. Joseph Halloway, of Hampton Wafer), by Young Counsellor, dam Curley, by Hatfield (2030), realized 21 guineas.

THE SALE OF THE THORNDALE HERD.—An important sale of shorthorned cattle has taken place, which will be quite a surprise to the agricultural public. Jas. O. Sheldon, Esq., White Spring Farm, Geneva, has purchased the entire herd of Sam. Thorne, Esq., Thorndale, Duchess Co., with the only exceptions of two bulls, the 6th and 12th Dukes of Thorndale, for which animals, we understand, Mr. T. will now receive offers. This is probably one of the largest transactions of the kind, if not the largest, which has ever occurred. By it Mr. Sheldon is placed at the head of what is undoubtedly the leading herd in America, if not in the world. There are, perhaps, one or two which count larger numbers, but we presume no other breeder in the United States or Great Britain has more than *one-half the number* of pure Bates animals now united in Mr. Sheldon's hands. Out of the six score or more, all together, which compose the combined herd, he will doubtless be able to offer immediately some opportunities to purchasers, of rare occurrence, and which would not occur now, but for the union of the two herds; while, in the progeny resulting from the means thus placed at his command, we may hope for the most brilliant successes in the future, as regards the well-won reputation of the breed. A word of regret at losing the name of Mr. Thorne from its high place on the current list of American breeders, may well accompany this announcement of Mr. Sheldon's good fortune. What has been accomplished at Thorndale will not be forgotten, and the name will be carried down in the pedigrees of many a future generation, both in this country and in England. The valley of the Hudson has lost what to the agricultural pilgrim has long been one of its chief attractions—

> "Westward the star of empire takes its way,"

and the beautiful village of Geneva will more than ever become a centre of interest to the traveller.—*The American Cultivator*

FARM-HOUSES.—A return has been made to the House of Commons of the amount of assessment upon farm-houses in respect of house duty in the financial year ended March 31st, 1866. The total amount for England and Wales was £13,940, the number of farm-houses assessed being 23,582, and their annual value £557,720. The largest numbers were in the counties of York, Lincoln, Essex, Warwick, Norfolk, Kent, and Stafford, no others having so many as a thousand. Shropshire approaches that number the nearest, having 952, the annual value of which is £22,173, and the amount of duty thereon £553. Montgomery comes next, with 56, the annual value of which is £1,147, and the amount of duty thereon £28. Flint is third, with 54, valued at £1,289, and paying duty to the amount of £31. Merioneth has only six farm-houses assessed to house duty, the annual value of which is £157, and the amount of duty thereon £3 18s. 6d. Even this is not, however, the smallest number in any county, for Carmarthen and Pembroke have only five each, Cardigan two, and Anglesey only one.

WARWICKSHIRE CHAMBER OF AGRICULTURE.

OPENING DINNER.

A dinner to inaugurate the establishment of a Chamber of Agriculture for Warwickshire was held at St. Mary's Hall, Coventry, on Thursday, May 2, the Earl of Clarendon presiding.

The CHAIRMAN, in proposing the toast of the evening, "The Warwickshire Chamber of Agriculture," said the object for which they were assembled, the importance which was attached to it, the interest which it excited, and the hope of usefulness with which it was viewed, were all attested by the numbers and respectability of those whom he had the honour to address; but he thought it would not be out of place, or in any way detrimental to their future success, if they, on that occasion, which, though not the earliest, was the most public of their proceedings, came to an understanding among themselves as to the principles to which they intended to give effect. It would be useful to themselves in steadily directing their energies; it would be useful to others in dispelling delusions, for they must not disguise from themselves that Chambers of Agriculture, capable as they were, if well conducted, of vast and beneficial development, were viewed in certain quarters with feelings of apprehension. They were thought to be Trades' Unions in embryo. He spoke, let him say, from his own knowledge—from what he had actually heard. Chambers of Agriculture were thought by some to be anti-social, and as having a tendency to organise an uprising of a class supposed hitherto to have been passive against another class supposed hitherto to have been dominant. Some men might harbour evil designs, others might have an immoderate tendency to panic; but his belief was that these notions were chimeras. The object of Chambers of Agriculture should be to advance steadily—to promote by every possible means the interests of agriculture; to promote those interests by an elucidation of facts, by the lights of experience, and by the application of science. In the desire which agriculturists and cultivators of the soil were now manifesting to better their position, social and national, he could see nothing anti-social—nothing that was subversive; on the contrary, he looked with the greatest satisfaction at that movement, which showed that knowledge was producing its legitimate results; that knowledge, with its increased facilities, is spreading; that the cultivators of the soil were determined to emancipate themselves from the disadvantages under which they had hitherto laboured, as compared with manufacturers and other inhabitants of towns, who had an opportunity of interchanging ideas and of fostering that spirit of association without which nothing useful is attempted, and nothing great is ever achieved. That was not setting class against class. That would not—and ought not—to disturb those friendly relations between landlord and tenant which had been productive of such substantial benefits, and which he trusted would always continue. There was no one who could say that the landlord, who had an intelligent and well-educated tenantry—a tenantry who were capable of meeting the requirements of the times, and who were ready to adopt all those improvements which the inventive genius of the age is bringing forward—would not be happier and wealthier than the man who had such a tenantry as he and many others could remember having existed in former days, whose chief pride was that they deviated in nothing from the practice of their forefathers, and who would have been as willing to see an evil spirit come upon the land as they would a drainer. It must ever be borne in mind that a tie of common interest bound together the owners and occupiers of land, and it was only by a misuse of reason or a perversion of common sense that the two classes could be supposed to represent antagonistic interests. There might be differences of opinion as to how the productive powers of nature may be best developed, and as to the manner in which her bounties may be best appropriated, and with respect to the rights of capital and the just claims of labour; but these were matters which required to be watched and constantly discussed in a spirit of identical, not of opposing interests—in a spirit, so to speak, of a joint-stock company. It was for that reason that he ventured most respectfully, but with all the force that conviction could give, to say that it would be a grave error on the part of landlords if they held themselves aloof from these Chambers of Agriculture, which were one of the signs of that movement—that vast and advancing movement—which could not be retracted; and tenant-farmers would commit an error not less grave if they sought to dissociate themselves from their landlords, and to avoid rather than promote that harmonious action by which intelligence would be made to fructify, and legitimate intelligence develope itself far more safely and more quickly than by single-handed attempts to redress grievances, which would entail the penalty of resistance and the misfortune of enmity among men who ought to be friends. He trusted the example of Warwickshire would be followed throughout the country. They wanted no Trades' Unions in agriculture; and the best way to avoid them, or to avoid drifting into something corresponding to them, would be by raising up a frank, an honest, and a real understanding between owners and occupiers of land upon matters affecting their common interest; and he could see no better medium of cementing friendship and reconciling differences than that which was afforded by a well-conducted Chamber of Agriculture. He expressed his opinion that, as a usual rule, not to be adhered to pedantically, politics ought not to be admitted to their discussions. If such a rule was found expedient at agricultural gatherings generally, he thought it was the more especially expedient at the present moment, when all parties were so jumbled together that Conservative, Whig, and Radical seemed as much at a loss to know what to think as to know where they were going. Among the various questions which might be suggested for discussion, he might mention, for example, the subject of county expenditure, which seemed to him to require very strict supervision; and it was a matter in which tenant-farmers had a very direct interest. County-rates, generally speaking, were on the increase, and were not likely to diminish. He did not presume to say that a single shilling was improperly levied or improperly expended, but he did say that for the satisfaction of the agricultural interest a more strict supervision was desirable, and more evidence should be given than at present—he did not speak of any county in particular, but generally. There was another question arising out of this, and it was how the rates were to be levied—whether upon the land alone or upon other property besides. He was glad to see a Bill extending the area of rating had passed a second reading and had been referred to a select committee, and he thought the subject should be immediately taken into consideration by the Chamber of Agriculture, as he could conceive nothing that was more worthy of its attention; and the facts which might be brought out by the Chamber would be extremely useful to the select committee, and should be at once transmitted to them. The next topic to which he referred as being of great importance to agriculture was the abolition of the Turnpike Trusts—a matter which involved great difficulties, and great embarrassment in reconciling conflicting interests; but those difficulties were not insuperable, and he trusted a settlement of the difficulty would be arrived at by the substitution of a better, a more economical, and a more convenient system than that which now existed in England. They had been abolished in Ireland ten years ago. South Wales had been relieved of them by Rebecca, and London had for the last three years relieved herself from tolls which had stuck like leeches to her suburban districts. That the thing was practicable and ought to be done was apparent from the report made to the Committee of the House of Commons in 1864, which stated that the tolls were unequal in pressure, costly in collection, inconvenient to the public, and injurious, by causing serious impediments to the free course of traffic. He believed that statement correctly described the feelings of Warwickshire men on the subject. There would be considerable difficulty in settling this question, but he was glad to see that on the previous day there was a debate in the House of Commons the spirit of which was favourable to doing away with tolls. He would only ask them to bear in mind that the cost of collection and management of turnpikes amounted to 40 per cent. on the amount received, which fully proved that there was no system which could be adopted more injurious or less economical than the present. He would suggest the advantage of Chambers of Agriculture sending up deputations to the select committee to state the facts with regard to the operation of the present system. There was another subject in reference to which those things called stubborn facts had done a great deal; but facts required a great deal of soaking, and when they met with a stratum of antediluvian prejudice they sometimes did not penetrate so deep as one could desire. He alluded to the question of drainage. There was nobody at the present day who denied the advantages of drainage, but he thought the necessity of it was not generally recognised. The Noble Earl excited much amusement by relating how, having vainly urged one of his tenants to drain a hill-side which grew a very luxuriant crop of rushes, he did one part of it himself, and having thus clearly shown the wonderful effects of drainage, in changing barrenness and waste to fertility and profit, he confidently appealed to the farmer to allow the work to be completed, when, to his astonishment, he declared he would sooner pay a trifle more rent to have it left as it was. He felt satisfied that if that man had been enabled to associate with others, by being a member of a Chamber of Agriculture, he would not have died in the conviction that it was better to grow rushes than to lay drains. He knew that drainage was expensive, but, at the same time, he believed that there was no investment which gave a better return, and his principal reason in alluding to the subject was that it was not generally known or appreciated that the burdens incurred by drainage might be greatly alleviated by borrowing money from the Government or the Lands Improvement Society, under the supervision of the Enclosure Commissioners, and which was converted into a moderate rent-charge for a term of 27 years, after which the improvement remained. This power of borrowing through the Government had been wisely extended to farm-buildings and tenements, and he thought it would be a question well worthy the attention of enlightened Chambers of Agriculture to consider whether the power of that Act might not, under certain regulations and strict supervision, be beneficially extended to labourers' cottages. He was speaking to practical men, and he would ask why it was that farmers erected excellent and comfortable buildings for keeping their stock? It was because they knew they could not keep their cattle in health, and could not get good manure, unless they had such facilities; and for the same reason they would have good stables for their horses, because they knew that unless horses were well kept they could not be got to perform the amount of work required of them. Now, he thought that in the cultivation of the land the man was not inferior in importance to the horse, putting aside all the moral and Christian obligations that ought to weigh with us so heavily; but let him ask whether a man who gets up half rested, and puts on his half-dried clothes and shoes, and trudges four or five miles to his work, would be in a state to earn even the scanty wages that he received? Cottages are bad investments, he knew, and people shrank from building them, but they were not wholly unproductive, and the difference of interest between what they do and ought to produce would be made up by the improved quality of the labour of the man who lives close to his work. Many of the labourers would do an hour's additional work rather than incur the useless fatigue of the three hours' walk to and from their homes. The whole subject had been painfully pressed on public attention by the disclosures made before the Commission on Agricultural Gangs. It appears that in the eastern counties, between the public and private gangs, upwards of twenty thousand children were driven daily, four, five, and six miles, to work for which they were unfit. Boys and girls, of ages averaging from twelve to eighteen, were herded together. The most frightful immorality ensued; and the opinion of seventy medical practitioners, and the returns of mortality, testified to the evils of the system. No slave plantation could furnish more horrors than the evidence taken before this Commission. He well knew that it was easier to talk about than to effect great social reforms; and changes such as he had alluded to must be the work of time and grave consideration; but nothing could be more worthy of the practical and enlightened men who would compose Chambers of Agriculture—nothing could be more calculated to raise them in the estimation of their fellow-countrymen than a determination to improve the condition of the labourer. There was another subject to which he would allude, although it was not popular; but he had many years attended to it, and knew the time would come when its importance would be universally recognized. He alluded to agricultural returns. It was impossible to exaggerate the importance to all persons interested in agriculture, or concerned in the supply of food for the people of this country, of obtaining reliable information respecting the extent of land under cultivation, and the relative acreage of the different descriptions of crops in the United Kingdom. Those returns would become more valuable as affording the means of comparing each year the annual and periodical variations in the cropping of the land. Such returns had been collected in Ireland for the last seventeen years. The people there were fully alive to the advantages they derived from them; and the willingness with which the information was contributed annually called forth the thanks of the Registrar-General. Warwickshire was not one of the unwilling counties, but in others there were owners and occupiers of land who looked upon these returns with the same horror as his tenant did upon draining. The Government now possessed efficient machinery for collecting the desired information; and it would be almost a disgrace that a comparatively small number of persons in England should force the Government to apply to Parliament for power to oblige all the occupiers in Great Britain to fill-in the schedules with the necessary figures. He begged to apologize to the assembly for having detained them at such great length, and he would conclude with one word, which should be a monosyllable—viz., "game." On an occasion like the present, he thought it would be like shrinking from his duty if he avoided allusion to it merely because it was a sore subject, though he need not add that his object would be to calm, and not to excite, irritation; but the fact was indisputable that high farming and high preserving did not, and could not, go hand-in-hand together. Farming was, now-a-days, a science requiring not only great capital, great skill, and knowledge, but the nicest calculations as to their application; and it was manifest that five hundred or a thousand hares, and rabbits *ad infinitum*, were great disturbers of calculations. The love of sport was genuine and general in this country, and he hoped it would always remain so. Every tenant was glad that his landlord should find game on his farm. No landlord wished to enjoy sport to the detriment of his tenant; but the appetite for enormous returns of game killed, which had latterly increased by indulgence, went beyond the legitimate requirements of sport. Those competitive bags entered into the region of vanity. The superabundant supply of Leadenhall-market entered into the region of lucre: hence arose irritation—some of it exaggerated, some of it well justified, but which ought not to exist, and which he was certain would be removed by a friendly discussion of facts between owners and occupiers of land in a Chamber of Agriculture which was conducted in a proper spirit. In short, there was nothing affecting the interests of agriculture which might not be advantageously discussed there. All the materials of strength existed, but they had been scattered. Farmers, owing to the nature of their calling, had been isolated, and agriculture had been weak; but, now that the necessity and practicability of union were felt, agriculture, he hoped, would take a foremost place as a great national industry. He saw no objection to a department of the Board of Trade being devoted to agriculture, but the advantage of it was not apparent to his mind. He would prefer a Central Chamber of Agriculture in London, to which the country Chambers should be affiliated, but which should have a national character, and be composed of men fully entitled to confidence. There would be the concentration of strength—the essence of agricultural opinion; there it would be determined what legislation could do for the landed interest, and what it could not do; and then the Government in its collective capacity and Parliament could be applied to. He thought this would have more concentrated force and weight, and in action would be more independent, than seeking aid from the Government, and that the experiment ought in the first instance to be tried. It would be matter for future discussion and decision; but in the meanwhile we might congratulate ourselves on being at length on the right groove, and on a momentum in the right direction being now given to agriculture which would prove to be a sound and lasting national benefit.

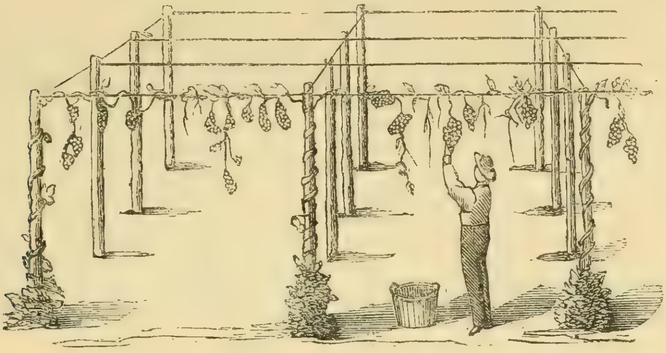
Mr. ALBERT PELL, in responding to the toast of "The Central Chamber of Agriculture," said: It is very encouraging to find a statesman filling the position Lord Clarendon does, in the face of the world, as a man of undoubted ability and tried experience in affairs of Government and policy, recommending us out of his own head to pursue a course which the common sense and the modest pretensions of humbler men have already made a fact. And as I have thus been led to refer to one portion of his address, he will forgive me if I make a remark on another; because on these too I am able, from local acquaintance and some connection with the scene of action, to speak to the point. Equally with him I share the feeling of all in this Hall, of pain and shame at the revelations of the gang system. I do not for one moment defend this miserable example of field and farm labour; but in palliation, or rather in explanation of the causes which have, in the fens at least, given rise to it, I wish to say that the population is so distributed in that recently reclaimed country, so grouped in the villages that cap the little hills, which are just lifted out of what was, when I was a boy, a waste of waters, where once the ingathering of the harvest and frost came together—that the work has in this now fertile district to be of necessity done by hands that come several miles to do it. Further, that house building in the fens is difficult and costly, from the depth at which the foundation has to be sought. But as regards the employment of women and children in field work, especially in its relation to education, the Central Chamber has already taken action; and the question is now being dealt with, I am sure, in no illiberal spirit by all the local chambers connected with us; and though, in common with all who have given thought to the subject, I see the greatest difficulty in satisfying one's mind on the expediency of compulsory education, no one professing to further the well-being of the poor—I mean of those among them who, on the score of their tender age or their weaker sex, may truly be termed objects for protection—if he be a gentleman himself, an instructed man, one of any means with time and some money at his disposal, can stand aloof from any movement which professes to secure for these unfortunates that rest from hard labour, compulsory rest if it can be obtained in no other way, which the law of nature says is due to them. As for politics, I disclaim those of a purely party character as not serving our purpose; but, stripped of this character, they remain peculiarly the province of these Chambers, and the day we abandon them we become effete and useless institutions. I do not wish to refer to such questions as the game laws on such an occasion as this: there are two sides to that as to other vexed questions; but as for politics, I say that if we know, as we do, that defective or obsolete legislation at any point stands between a community wanting work and food, and the means of obtaining them, and forbids the ample development of the one or the fullest production of the other, and if there is a bad moral side to it as well, we can put our institutions to no better purpose than that of repealing or modifying it. But all this, my lord, should be done in the spirit of moderation, caution, and unselfishness; not with noisy declamation, but with controlled discussion, in the spirit of those noble lines of a poet who has added so fine an illustration to the legend of this city in his poem of "Godiva," and who elsewhere teaches as to be

"Not slow nor swift to change, but firm
And in its reason bring the law;
That from discussion's lip may fall
With life that working strongly binds—
Set in all lights by many minds
To close the interests of all."

Mr. JASPER MOOE, M.P. for South Shropshire, replied to the toast of "The Lords and Commons." He had found in his own county that tenant-farmers rather unduly appreciated *bonâ fide* efforts to represent their views and promote their interests; and in other counties, from the cordiality Englishmen show to strangers, they were naturally led to over-estimate the capacity for usefulness of young and humble individuals. But the conclusion he drew from this was, that the past representation of farmers in the House of Commons had been unreal, and that to find members and their country constituents really acting together to accomplish common objects in Parliament was not the universal rule. Lord Clarendon had told them that Coventry men did not like "bunkum," and he would say simply what he felt. He felt that agriculture had long been unfairly represented. He believed that in the minds of leading statesmen of both parties, excluding the noble chairman, the tenant farmer was not a man of one-quarter the political importance of the compound householder in boroughs (loud cheers), and it was rarely that any agricultural question assumed more than a third-rate importance, compared with borough questions, in Parliament. There had been some exceptions with regard to the Turnpike Bill yesterday; but why was it that the press of that morning expressed surprise at the attention this question received—owing, he might assume, in a great measure, to the action of the Central Chamber of Agriculture. This was the first question the chamber had operated upon. It took a deputation to Mr. Walpole of members and farmers of all politics, including extreme Liberals, who had been attracted by curiosity; and Mr. Walpole expressed his surprise at the interest taken on the question; and when it came before the House it was treated with respect. Let them look at the failure of the representation of agriculture in the House of Commons in past years with regard to the malt-tax, with which question it was known he was associated. In 1834 the repeal was carried, but from that time to this the repeal had not advanced one atom. After the last election a manifesto was issued in his county, telling the farmers that they must be mad to return a Liberal because Mr. Disraeli was so certain to repeal the malt-tax. Well, he was much interested to see whether this certainty would prove to be such when Mr. Disraeli was Chancellor. The Anti-Malt-tax Association asked Mr. Read and himself to bring the question forward. They agreed to do so, and some time after he received one of those invitations to go into a tea room, which was an invitation he sometimes received, but never accepted. Well, at this, Mr. Read consented to give up the motion and agree to the question being referred to a committee, a fortnight before the Budget, which was a course of action that now concerned only Mr. Read and his constituents. But if they had referred it to a committee before Mr. Disraeli had had a chance of dealing with it, he felt that the malt-tax repealers would have been caught in a trap, from which he had saved them by proposing as an amendment, that it would be expedient to hear the financial statement first. This amendment of his followed the motion like a shadow, and when the motion was to come forward, Mr. Disraeli appealed to the proposer to give it up, which at once he did. He wished the farmers not to be bamboozled, and they would now clearly understand that Mr. Disraeli was not a bit more disposed to deal with the malt-tax than Mr. Gladstone. The object for them was to get some question of their own passed in the House. A leading member had told him this could not be the repeal of the malt-tax, for that he had never found any two men who, after they had made this question a ladder for obtaining a seat, cared one bit to see it repealed. He had considered whether they could not apply for an under-secretary attached to the Board of Trade to represent agriculture. He believed the Chamber of Agriculture might effect this if desirable; but the argument it would be opposed with was that there would not be work enough for them to do. The question he advised them to consider was County Financial Boards. If it was right that representation should be co-extensive with taxation, no one could deny that tenant farmers—say one for each union—ought to have a voice with magistrates in the disposition of county expenditure. He was perfectly aware this might be considered in some quarters a most unpopular proposal, but he had discussed it with men of the best experience, and found the justice and policy of it admitted. Let him ask them to consider of what use such men with semi-magisterial responsibility might not be to counties in many respects. I ask only one. Of what convenience would it not have been to have had such men, always resident on the spot, entrusted with the power of signing orders for the removal of cattle during the past year! The same men who consented to a very low borough franchise, supported Mr. Walpole in trying to keep the county franchise as high as possible; and similarly, whilst they get persons of one quarter of the social position of tenant farmers made magistrates for party purposes, in some boroughs—he did not say in Coventry

—they would allow no co-operation from men of such substance as leading agriculturists in county business. There were now twenty Chambers of Agriculture duly formed and attached to the Central Chamber, with 4,500 members; ten more were forming, but were incomplete. He hoped by the end of the year they would have 10,000 members. Let there be a friendly rivalry between counties which would have the best chambers. They had nearly 500 members in Shropshire; but few counties would compete with Warwickshire in the *éclat* given to the whole movement by their noble chairman.

AMERICAN HOP CULTURE.



Among Western farmers hop-growing is comparatively a new thing, but the consequence which this branch of agriculture is sure to attain, and the profits arising from the culture of hops, render all information on the subject of the utmost importance to farmers everywhere, and particularly so in this part of the country, where the business is in its infancy. Statistics show that Austria, with its 150,000 acres of hop vines, seldom produces more hops than are required for home consumption; while England, with upwards of 57,000 acres, cannot supply her own brewers. In our own country there are between 20,000 and 25,000 acres of hops; yet, if it is true that we can raise as good an article, and obtain as large a crop as in either England or Austria, where it is their most profitable crop, is it not more than likely that this business will become one of our chief agricultural branches? The average yield of hops per acre during the past twenty years in England has been 700 pounds, while in America upwards of 900 pounds. Hops at 10 cents per pound will average the profits of wheat or corn. A glance at statistics shows the average price of hops as follows:—From 1821 to 1861, inclusive, 18 cents per pound, and during the last six years the average is over 30 cents per pound. Probably there has never been a time when the price has fallen below a paying figure; while at this time the price is five to six times above the actual cost.

It would be impossible to compute the increase in the consumption of hops in America, yet it is so constant and great that farmers can safely rely on good prices and large profits for years to come. The impetus given to the consumption of malt liquors by the excise tax imposed on evil spirits, together with that derived from the influx of foreigners, is so great that it will require extra exertion on the part of our farmers to meet the demand. Large quantities of hops were imported last year. We can much better afford to let England raise our bread-stuffs, than allow her to supply our breweries, for the profits of the former are more than double those of the latter. In view of the natural advantages of our soil and climate, our country is abundantly capable of not only supplying her own demand, but furnishing large quantities of hops for exportation. Their cultivation, instead of being difficult or complicated, is a simple and easy vocation; the labour need not be greater than is required in growing the same amount of corn; while any soil producing good corn will grow hops; if the soil is destitute of lime, this element may be supplied at the rate fa pint of unslacked lime to each hill.

The improvements of the present age have so lessened the expense and labour of producing hops, that the cost of starting a yard is hardly one-fourth what it was five years ago. The old method of taking two or three twenty-foot poles to the hill has been supplanted by a simple, economical system, by which a single stake eight feet in height is substituted; this stake, sawed into shape from any cheap material at hand, and boiled in creosote or gas-tar, becomes, in a measure, imperishable, and also has the advantage of being impervious to the insects so destructive to the plants, and which frequently find harbour in the common poles. These eight-foot stakes, sharpened at the end, are connected at the top by tarred twine, running in both directions over the yard, forming a durable net-work on which the vines are trained. The vines thus being exposed freely to the sun and air develop a finer fruit than can be produced by any other process, while the labour is greatly reduced by this process. Obvious as the economy of this system is, we would call the attention of the hop grower to one feature, which, though not so conspicuous, is nevertheless the most valuable point of the improvement. It is obviating the necessity of cutting off the vine in harvesting the crop, as every hop-grower, while deploring the necessity, is forced to do when he uses long poles; the increased demand for early-picked hops, together with the ravages of insects, increasing rapidly at the close of the season, compel him to pick early, as, if he would leave the crop on the vines as late as formerly, either he would have no crop to sell, or could not sell what he had, by their being damaged. By the system of training the vines low, the hop is picked without injury to the vine, which can then mature at leisure, leaving the roots strong and vigorous for its next year's work, and its vitality unimpaired. By this system the hop-yard will not run out, and no hills will die by being winter-killed. Though the vine is not immediately destroyed by the unnatural process of cutting it off at picking, its vitality is so weakened that a great amount of extra manuring is necessary to bring the yard up to the average crop; one quarter of the manure usually applied is as effective when, by using stake and twine, the vines are not cut at harvesting, and the root is left to mature.

Hops are subject to disease, and have enemies that prey upon them, which we must learn to overcome. The principal cause of mischief in our country is the hop-louse or aphis, which is destroyed in England by a solution of strong tobacco water; the mould is cured by flowers of sulphur. Our hops are fully 30 per cent. better than English; the English brewers and factors readily acknowledged this, and frequently remarked to us, while in their hop districts a year ago: "Do not check your hop-raising; you can find a ready market here for all your surplus, for we find them as good when a year old as our hops when picked."—F. W. COLLINS.—*In Prairie Farmer.*

THE AYRSHIRE AGRICULTURAL ASSOCIATION.

The stock shown was, on the whole, very meritorious, although we have seen the Ayrshires fully better represented in some of the classes. The agricultural horses were never before so numerous, nor so excellent in quality. The sheep were deficient in numbers, but those shown in the fat classes fully bore out the reputation which Ayrshire breeders and feeders have gained for producing a heavy-muttoned, good-woolled cross, either between the Leicester and the blackfaced, or the Leicester and the Cheviot varieties. The Shorthorns, as usual, were very poor—worse, indeed, than we have seen them, and this is saying about as little in their favour as it is possible to say. There was a large turn-out of hunting stock, but we cannot truthfully state that the quality was equal to the quantity. Indeed, there was scarcely one first-class animal amongst the whole lot; but the prize-takers, and especially the first three-year-old filly, were fair animals. The pigs were as a whole meritorious, and the poultry classes were fairly filled.

JUDGES.

Ayrshire Dairy Stock.—A. Buchanan, Garscadden Mains, New Kilpatrick; H. D. B. Hyslop, Tour, Kirkconnell, by Sanquhar; R. Wilson, Forehouse, Kilbarchan; D. Tweedie, Castlecrawford, Abington, Lanarkshire.

Horses.—J. Salmon, Benston, Johnston; O. Brown, Glenlee, New Galloway; J. Steedman, Boghall, Roslin, by Edinburgh.

Hunters.—Hon. G. R. Vernon, Mount Charles, Ayr; R. Ewen, of Ewenfield, Ayr; A. Algie, Ireland.

Saddle-Horse and Pony Sweepstakes.—Colonel Hay Boyd, of Townend, Ayr; W. Walker, Bellsbank, Dalmellington.

Blackfaced and Cheviot Sheep.—R. Kennedy, Dalmakerran, Tynron, by Thornhill; J. Greenshields, Westtown, Lesmahagow; J. Wilson, Lennox, Douglas.

Shorthorn Cattle, Leicester and Cross-bred Sheep.—A. Young, Kier Mains, Dunblane; P. Reid, Drumfork House, Helensburgh.

Fat Stock and Pigs.—D. M'Farlane, Tow, Helensburgh; F. Bell, 194, Argyle-street, Glasgow.

CATTLE.

DAIRY STOCK—AYRSHIRES.

Bull calved before 1st January, 1865, and not exceeding eight years old.—1. D. Gregg, Brownhills, Beith; 2. Mrs. Lees, West Cairngillan, Tarbolton; 3. W. Donald, Sornbeg, Galston; 4. J. Wallace, Auchenbrain, Mauchline. Commended: R. Lindsay, Gardrum, by Fenwick.

Two-year-old Bull.—1. R. Kerr, Wattieston, Kilbirnie; 2. J. Parker, Broomlands, Irvine; 3. T. Donald, Fardlehill, Kilwinning; 4. D. Rankine, Goatfoot Farm, Galston. Highly commended: J. Taylor, Muir, Mauchline. Commended: W. Mair, Floors, Kilmaurs.

Bull Stirk.—1. R. Caldwell, Knockshoggle, Coylton; 2. J. Anderson, Gass, Straiton; 3. R. Lindsay, Gardrum, by Fenwick. Commended: J. M'Cartney, Wrighthill, Stair.

Aged Cow in Milk, and Aged Cow in Calf.—In milk: 1. P. Conner, of Cahool; 2. W. Wilson, South Biggart, Beith; 3. W. Kirkwood, Shankston, Patna; 4. R. Murdoch, Kilmarnock. Commended: J. N. Fleming, Knockdon West, Campbeltown; J. Brown, Cartleburn, Kilwinning. In calf: 1. W. Caldwell, Boydston, Ardrossan; 2. W. Reid, Clune, St. Quivox; 3. J. N. Fleming. Commended: W. Muir, Marsh Land, Beith.

Three-year-old Cow in Milk, and Three-year-old Cow in Calf.—In milk: 1. J. Ritchie, Broadwood, Coylton; 2. W. Kirkwood, Shankston, Patna; 3. W. Kirkwood; 4. J. N. Fleming. Commended: P. Conner, of Cahool. In calf: 1. J. N. Fleming; 2. W. Muir; 3. J. Meikle, Brownhill, Tarbolton. Commended: H. Mair, Knockjarder, Dalrymple.

Lot of Three Cows of any Age, bred by Exhibitor, in Calf or in Milk.—1. R. Caldwell, Knockshoggle; 2. P. Conner, of Cahool.

Two-year-old Heifer or Quey.—1. R. Murdoch, Kilmarnock; 2. J. Campbell, Low Milton, Maybole; 3. Mrs. Lees, West Carngillan, Tarbolton. Commended: J. Kerr, Byres, Kilmarnock.

Pair of Two-year-old Heifers or Queys, not in Calf.—1. J. Smith, Cockhill, Tarbolton; 2. J. Wright, South Sanquhar; 3. Q. Williamson, Byres, Coylton. Commended: A. H. Oswald, of Auchencruive.

Pair of Quey Stirks.—1. R. Caldwell; 2. J. Wilson, Barclaugh, Coylton; 3. J. Wright, South Sanquhar. Commended: J. Parker, Broomlands, Irvine.

SHORTHORNS.

Bull, not exceeding Five Years old.—1 and 2. J. M'Clymont, Balsaggart, Maybole.

FAT STOCK.

Three-year-old Ox or Heifer, Pure or Cross.—1. J. Cunningham, Treesbanks; 2. Captain Campbell, of Craigie.

Fat Cow of any Age of the Ayrshire Breed.—1. Captain Campbell, of Craigie; 2 and 3. Q. Bone, Grennan, Ayr.

Two-year-old Ox or Heifer of the Ayrshire Breed.—1. D. Manson, High Thornyflat, St. Quivox; 2. J. Wright, Shalloch, Girvan; 3. J. Wright.

Open Prizes.

Ayrshire Bull, not exceeding Eight Years Old.—1. D. Gregg, Brownhills, Beith; 2. Mrs. Lees, West Carngillan, Tarbolton.

Two-year-old Ayrshire Bull.—1. R. Kerr, Wattieston, Kilbirnie; 2. J. Parker, Broomland, Irvine; 3. C. D. Inglis, Stair House, Stair.

Five Ayrshire Cows, any Age.—1. P. Conner, of Cahool, Drumdow, Stair; 2. W. Wilson, South Biggart, Beith. Highly commended: W. Muir, Marshyland, Beith. Commended: R. Mudoch, dairyman, Kilmarnock.

Extra Stock—Alderney Bull.

W. Aitken, V.S., Langside, Dreghorn.

HORSES.

Brood Mare, for agricultural purposes, having had a foal in the season of 1867, or being in foal at the time of the Exhibition.—1. W. Kirkwood, Shankston, Patna; 2. W. Speir, Shortlees, Riccarton; 3. J. Easdale, Lintseedridge, Dalry. Commended: R. Guthrie, Crossburn, Troon; J. N. Fleming.

Gelding or Mare, for agricultural purposes, four years old and upwards.—1. D. Kerr, Holms, Kilbirnie; 2. W. Love, Scoup, Beith; 3. J. N. Fleming. Commended: W. Love, Scoup; J. Gray, Tongue, Tarbolton.

Three-year-old Ditto.—1. D. Kerr, Holmes, Kilbirnie; 2. J. Barr, Harperland, Dundonald; 3. F. Barr, Bogside, Beith. Commended: A. Ralston, Lagg, Ayr; J. Young, Rottenrow, Craigie.

Two-year-old Gelding or Filly, for agricultural purposes.—1. J. N. Fleming; 2. D. Hunter, Guiltreehill, Kirkmichael; 3. R. Templeton, Midton, Craigie.

One-year-old Colt.—1. J. N. Fleming; 2. T. Craig, Onthank, Kilmarnock. Commended: J. N. Fleming.

One-year-old Filly.—1. J. Craig, Drumshang, Ayr; 2. J. Easdale. Commended: A. Ralston, Lagg.

Pair of Agricultural Geldings or Mares.—1. Dalmellington Iron Company; 2. J. Rankine, Beoch, Maybole. Commended: W. Dunn, of Dalmore, Stair.

Two-year-old Entire Colt.—1. J. Henry, Southannan, West Kilbride; 2. R. and J. Muir, Leith Mill, Dundonald; 3. A. Douglas, Balkemie, Dailly.

Open Prizes.

Saddle Horse (Mare or Gelding).—1. R. Ewing, of Ewingfield, Ayr; 2. Major M'Alester, of Kennox, Stewarton; 3. J. Boyle, Raith, Tarbolton.

Brood Mare for agricultural purposes.—1. J. Easdale; 2. J. N. Fleming.

Pony, not exceeding fourteen hands high.—1. G. Steele, horse-trainer, Ayr; 2. Dalmellington Iron Company; 3. Master Vernon, Mountcharles, Ayr. Commended: Master E. Fairlie, Coodham, Symington.

Two-year-old Colt or Filly, got by a thoroughbred horse, and bred by a proprietor or farmer within the county of Ayr.—1. Colonel H. Boyd, of Townend, Ayr; 2. Colonel H. Boyd. Highly commended: J. Reid, Mid Sanquhar, St. Quivox. Commended: A. Barclay, Caledonian Foundry, Kilmarnock; and J. Cochrane, of Mains, Dunlop.

Three-year-old Colt or Filly, got by a thoroughbred horse, and bred within the County of Ayr.—1. J. Reid, Clune, St. Quivox; 2. G. Sloan, Brockloch, New Cumnock. Highly commended: J. Cunningham, Trees.

Yearling Colt or Filly, got by a thoroughbred horse, and bred within the county of Ayr.—1. Colonel H. Boyd, of Townend; 2. J. Craig, Blackwood, New Cumnock. Highly commended: J. Cunningham, Trees. Commended: J. Reid.

SHEEP.

BLACKFACED.

Two Aged Tups, selected from a sheep stock of not less than eighty.—1. J. Mitchell, Lochengerroch, New Cumnock; 2. J. Craig, of Craigdarroch, Polquheys. Commended: J. Mitchell, Lochengerroch.

Pair of Two-year-old Tups, selected as above.—1. James Craig; 2. J. Sloan, Barnhill, Patna.

Two Tup Hoggs, selected as above.—1. J. Craig; 2. Captain Kennedy, of Bennane, Girvan. Commended: Captain Kennedy.

CHEVIOT.

Two Aged Tups.—1. T. M'Millan, of Changue, Barr; 2. J. Lamb, Dalquhairn, Barr.

LEICESTER.

Tup, two-shear and upwards.—1. D. Gray, Barmuirhill, Tarbolton; 2. J. N. Fleming.

Two Ewes, not exceeding five years old, with their Lambs.—1. D. Gray; 2. C. D. Inglis, Stair House, Stair.

CROSSES.

Pen of Five Wether or Ewe Hoggs, a cross betwixt the Cheviot and Leicester.—1. J. Cunningham, Trees, Maybole; 2. J. Cunningham. Highly commended: G. Tennant, of Creoch, Ochiltree. Commended: R. Guthrie, Crossburn, Troon.

Pen of Five Wether or Ewe Hoggs, a cross betwixt the Blackfaced and Leicester.—1. A. Ralston, Lagg, Ayr; 2. J. Cunningham. Highly commended: A. Ralston. Commended: J. Cunningham.

Pen of Five Wether or Ewe Hoggs, of any cross.—1 and 2. J. Cunningham.

PIGS.

Boar of any breed.—1. D. Hunter, Guiltreehill, Kirkmichael; 2. A. Dykes, Bellsbank, Ayr; 3. A. Ralston.

Breeding Sow of any breed.—1. D. Hunter; 2. A. Paton, Stonecalsey, Symington.

Breeding Sow of any breed, with her Pigs receiving her milk at the time of competition.—1. J. N. Fleming; 2. J. Kennedy, Sessionfield, Ayr.

EAST LOTHIAN AGRICULTURAL CLUB.

The usual monthly meeting of this Club was held at Haddington on Friday the 3rd of May—Mr. G. Hope, Fentonbarns, in the chair.

THE GAME-LAWS AND THE LAW OF HYPOTHEC.

In pursuance of the resolution adopted at the last meeting of the members, the Club proceeded to take up the Bill of Mr. M'Lagan for the Amendment of the Game-laws, and that of Mr. Garnegie for the Amendment of the Law of Hypothec.

Mr. HOPE introduced the discussion, and first took up the question of hypothec. He contended that the Bill of Mr. Carnegie was founded on right principles, and that the Club ought to petition in its favour. He scouted the idea that seemed to be entertained at the county meetings in regard to the tenantry being benefited by the preferential right of hypothec, and concluded by moving that the Club petition in favour of Mr. Carnegie's Bill.

Mr. DURIE, Barneymains, seconded the motion.

Mr. HARPER, Snawdon, believed that the scope of the law was to raise the rent of the land; and denied that it was of any benefit to the small farmer. Still, in face of the great opposition that was to be anticipated, he thought it would be better had the Chamber of Agriculture limited their demands to restricting the hypothec of the landlord to one year's rent. He would not, however, make any motion.

The motion of the Chairman was then unanimously agreed to.

Mr. HOPE then took up the question of the Game-laws. Wherever hares and rabbits were to be found it was quite impossible, he contended, for any farmer to cultivate his land properly; and even when excessive damage from the cause was clearly visible, there was the greatest possible difficulty in obtaining any redress in courts of law. There was no change asked in the law with regard to pheasants and partridges, for these creatures did little damage to the crops; but it was quite different with regard to the hares and rabbits. He did not ask for any interference with any contract that might be made between tenant and landlord; all that he asked was that no legislation should be tolerated that had a tendency to increase the quantity of game in the country. He did not think that any change was needed in the trespass-law, as he believed the present law gave both farmers and proprietors ample protection against offenders in this respect. Mr. Hope then went over the clauses in Mr. M'Lagan's Bill, and also referred to the clauses of Lord Elcho's Bill, showing the superiority of the former. He did not ask them to petition against the latter, but only in favour of the former.

Mr. SKIRVING, Camptoun, though a sportsman, came to the same conclusion as Mr. Hope in favour of Mr. M'Lagan's Bill, and expressed his surprise that Lord Elcho should have brought in such a Bill as that now before the country. There had seemed to be an opinion among the landlords that trespassing would increase under such a Bill as Mr. M'Lagan's; but he did not believe it. It was quite a mistake; his own experience being all the other way. Over the country where hares were scarce, a trespasser would gain much more money by shooting wood-pigeons than by shooting hares. Trout rivers were protected by the law of trespass, so was private property; and, in the same way, he had no doubt that the law, even in the event of the hares and rabbits being taken out of the Game Act, would be sufficient to keep trespassers off the land. Though a Tory in principle, he was quite astonished at the way in which the question had been treated by the Conservative party, and said he could not but express his surprise at the statements made at the county meetings. He believed that most of the proprietors were men of enlightened sentiment; but they seemed to be allowing themselves to be led by the nose by a minority, and all on the question of the hares. He would just put it to them if the hares were worth preserving, seeing they were sacrificing so much on their account. Although Mr. M'Lagan's Bill might be thrown out just now, it was certain that either this or a much more stringent law would be passed sooner or later. He referred to the "wretched German system of *battues*" as one of the causes that had led to the present excitement against the Game-laws, and said that some game preservers broke the law by selling it out of season. It was very hard that a poor farmer should be compelled to pay a licence for the sale of game, when landed gentlemen were allowed to sell hundreds of head of game without being called on to do so. He characterized the action of the Conservatives on the game question as "stolid stupidity," and cordially supported the motion of the Chairman to petition in favour of Mr. M'Lagan's Bill.

Mr. Paton, Standingstane, was quite opposed to the motion, as the Bill of Mr. M'Lagan would just have the effect of taking the game from the landord and the tenant, and handing it over to the poacher. He felt quite surprised that so many of the farmers, including their respected Chairman, had taken up an opposite view. He thought that Lord Elcho's bill, though not so good as it ought to be, was yet better than the other. The best part of Mr. M'Lagan's Bill was that of transferring the jurisdiction in game cases from the justices of the peace to the sheriff; and he thought that Lord Elcho's Bill would be improved were a similar clause introduced.

Mr. Shepperd, Gleghornie, said that the real battle ground on which the question had now to be fought was that of trespass. Whenever poaching ceased to pay, trespass would cease also. The object of Mr. M'Lagan's Bill was to diminish game, and so far to make poaching an unpaying concern. It was hard that farmers should have to continue to act as sub-gamekeepers; but so long as the law remained as at present, poachers would come in in spite of all efforts to keep them out. As to Lord Elcho's Bill, it was most absurd; and if carried it would only make them worse than they were.

Mr. Douglas, Athelstaneford, said he did not think that trespassing or poaching could be kept within moderate bounds by the taking of the hares and rabbits out of the Game Act, and feared that the offence would increase. He thought that the only parties involved in this matter were the landlord and the tenant; and that were the law so altered as to give them both a mutual right to the game, it would tend to solve the present difficulty. He referred to what had been done by his proprietor (Mr. Kinloch) in this direction, and contended that even were Mr. M'Lagan's Bill passed, hares and rabbits could be preserved as much as ever. He was, however, in favour of the clause in the Bill with regard to the jurisdiction in game cases, and hoped that this would be embraced in Lord Elcho's Bill.

Mr. Harper, Snawdon, heartily approved of Mr. M'Lagan's Bill. He had, however, no sanguine hopes of getting this grave question settled unless they adopted what their Aberdeen friends suggested—viz., that of making contracts reserving the game illegal. He did not approve of this himself, but it showed the tendency of the feeling in the North.

Mr. Durie, Barneymains, supported the Bill of Lord Elcho, on the ground that it gave the mutual right of the game both to landlord and tenant. The one gave the right to the winged game, as well as the hares and rabbits; but the other only gave to them the hares and rabbits, in common with Tom, Dick, and Harry. The one, therefore, was much more in favour of the farmer than the other. The conclusion he had arrived at was this—that if they could get Lord Elcho to adopt the jurisdiction clauses (4 and 5) of Mr. M'Lagan's Bill, they would get a good farmers' bill. He moved that Lord Elcho's Bill, with the clauses referred to, would be acceptable to the Club.

Mr. Douglas seconded the amendment.

Mr. Richardson, Drylawhill, supported the motion of Mr. Hope.

Mr. Elder, Bearford, though not suffering himself from game, deeply sympathised with those who did. Though he generally approved of Mr. M'Lagan's Bill, he did not relish the idea of giving the general public the same right to the game as the tenant.

The motion was then put to the vote, when the Club, by a large majority, resolved to petition in favour of Mr. M'Lagan's Bill.

THE SCOTTISH LAW OF HYPOTHEC.

The obnoxious Scottish law of hypothec has been put upon its trial during the past week, and, by a vote of the House of Commons, been declared "not guilty" of the crimes laid to its charge; the jury consisting of Scottish members deeply interested in the maintenance of the law, aided by certain English and Irish landlords who have no personal interest in the question, but are ever at hand to uphold the power of their class. The privilege in this instance, which Mr. Carnegie's bill proposed to abolish, consists, first, of a power of sequestration over the property of a tenant from the moment a lease of a farm is executed; secondly, the power of compelling the purchaser of a portion of the stock or crop of a defaulting tenant—such purchaser having paid honestly, and without a knowledge of the indebtedness of the tenant to his landlord—to pay over again to the latter the full amount of the purchase; thirdly, the power of retaining, without any compensation or allowance whatever, the benefits resulting from the outlay of capital by the defaulting tenant, although such outlay may involve indebtedness to many others, who are thereby most unjustly deprived of their property, to the sole benefit of his landlord; fourthly, the power of overriding all other claimants whatever upon the property of a defaulting tenant, so that while his capital—the land—increasing in value in the hands of a tenant, is safe from the slightest infraction, he also enjoys the legal right of securing, to the last farthing (so far as the tenant's property on the farm is concerned), the rent of such land. The merchant or tradesman on the other hand who has unwittingly given the tenant credit for goods, thereby entrusting him with both his capital and profit upon it, is deprived of the power of taking any share of the proceeds of the property; his claim being wholly subordinate to that of the landlord, who, in fact, by virtue of his sequestration, takes entire possession of the whole, selling it by public roup at whatever price it will fetch; and after paying himself out of the proceeds, nobly hands over the balance, if any, to the other creditors, who may or may not obtain a small dividend.

Such are the main principles of this unprincipled law, the total repeal or abolition of which Mr. Carnegie's bill would have effected. The arguments were unanswerable, because they were founded on the stern and simple principles of justice between man and man. Those against the bill were as fallacious and contradictory as possible. Thus, one honourable member denied that the law was for the benefit of the landlord; whilst another, more bold, asserted that the landlord had a just and necessary right to enjoy the security afforded him by it. A third averred that the abolition of the law would weaken the securities of the landlord over the land. If the speaker means that by it the proprietor will be placed, in regard to his rent, upon the same footing as the other creditors, we admit it. But even then the landlord would have the advantage of having his capital, the land, untouched; whilst the merchant would risk both capital and the profit upon it, and the landlord enjoys a power of security for his property possessed by no other class in the United Kingdom. One member asserted that the abolition of the law would put an end to long leases, weaken the securities that now exist over the land in Scotland, and would be opposed to the interests of the tenants *generally*. But the absence of such a law in England does not prevent long leases; and heaven knows how it encourages them in Scotland, where executions, and consequently forfeiture of leases, are of almost daily occurrence. We are totally at a loss to see how the abolition of hypothec would be opposed to the interests of the body of tenantry. If it had been said certain tenants in *particular*, instead of generally, and the effect confined to those cases in which landlord and tenant have conspired to rob all the rest of the creditors, we could have understood this; for such cases have been, and no redress obtained by those injured; but that the tenant farmers would be generally aggrieved by the abrogation of the law is perfectly untenable. As to the justice of the law for the security of the landlord, it stands solely on the old Border principle "that they may take who have the power, and they may keep who can." On no other principle than that of the right of the strongest can the law of hypothec be based. It is purely a class law, for which there is no statute whatever, being one of the worst relics of the old feudal system, established under an entirely different state of things from what now exists, and as much opposed to the spirit of the age as it is to good husbandry and the commonest principles of justice between man and man. Why the Scottish landlords should enjoy such a privilege, possessed by no other body in the three kingdoms, has never been shown; nor can all the special pleadings of the Scottish lawyers make out a feasible defence for this. Their arguments would apply as well to England and Ireland as to Scotland, and to a merchant or tradesman as well as to a landowner. What would be the state of trade and commerce, if the principle were to be thus extended? and other classes have quite as much moral right—which is, none at all—to exclusive protection, as a Scottish landlord.

We have named some of the principal arguments raised against Mr. Carnegie's bill against a law founded, not upon any statute of Parliament, but on decisions of the Supreme Court of Scotland, at very early periods of its history; and this arbitrary law was proved, before the Commission, to be freely used in the present day, causing ruin to the tenants in some districts, great loss and injustice to ordinary creditors, and banefully affecting the interests of tenant-farmers generally. By virtue of this law, the landlord holds a power over the capital of the machinist, the manure-manufacturer, the cattle-dealer—every tradesman or dealer with whom the tenant transacts business on credit, or for cash in selling his produce—for both buying and selling are alike dangerous; and if the law is still to be in force, there will be no resource for a merchant or tradesman, except to refuse credit to a tenant-farmer, without collateral security from a third responsible person.

The only really good argument in favour of the law of hypothec is, that it enables a poor man to take a farm, by his landlord giving him credit for two years' rent. But at whose risk is this done? Why, at that, not of the landlord, but of every other person who is fool enough to trust him. Is it an advantage to the State that such a man should be installed into a farm, with the certainty that one bad season, at the commencement of the lease, would be followed up by an execution upon the property of the tenant, and his expulsion from the land? No: it is *not* for the advantage of the tenant that the law is retained; it is for the purpose of obtaining unjustifiably-enormous rents from needy men, by the system of competition for farms peculiar also to Scotland, and for securing the landlord at the expense of every other creditor, that the law is retained.

This argument on the part of the advocates for the law was well met by Mr. Carnegie. He asked, "At whose expense is the two years' credit given to the tenant? Sydney Smith said, 'Benevolence is inherent in the human heart. A. never sees B. in distress, without hoping that C. will relieve him:' and it seems to be on this principle that it is proposed to continue this law." Just so. The poor tenant, having two years' rent to trade on, pays punctually for small mercies (or purchases), but takes credit of his machinist, manure-manufacturer, and cattle-dealer for his larger dealings. Then comes a bad year or two; and the landlord or his agent, who is hovering like a vulture over him, without a moment's notice, pounces upon the farm, and sweeps off everything—cattle, sheep, machines, manure—all unpaid for, and without any means of redress for the other creditors.

I ask, is this a just law? Or rather, should not the Scottish landlords be ashamed to come forward to advocate its continuance, as if every other class of society were formed only to minister to *their* especial security?

We shall conclude by a recapitulation, in the form of queries, of the process by which the law of hypothec is carried out in the present day:—Is it not a fact that, upon a farm becoming or likely to become vacant, this is put up to auction—or competition, if you like the term better, the effect being the same—and knocked down to the highest bidder, who, ten to one, is a man of straw, but anxious to have a farm at any rate, trusting to the chapter of accidents to render the speculation good or bad, as the case may be?

Is it not a fact that, the instant a lease is executed by a poor tenant, he is compelled to sign also a sequestration over all the property that may be on the farm at any future period, including stock, crop, and machinery, in consideration of which the landlord is to allow him to keep the payment of rent in abeyance for two or two and a-half years?

Is it not a fact that both parties calculate upon the tenant's obtaining credit for large purchases of stock and machinery, during those years, by which the working capital of the farm, and consequently the landlord's security, are enhanced to the same amount?

Is it not a fact that, should a bad season or two occur at the commencement of a lease, the poor tenant is certain to be unable, at the expiration of the landlord's credit, to pay the rent, and be left without a chance of retrieving his position, having nothing to fall back upon, and his other creditors pressing upon him for payment?

Is it not certain that, under such circumstances, the landlord, unless he is a merciful man, will avail himself of the law, and put his sequestration in force, selling stock, crop, and implements and machinery by public roup (the chief part unpaid for), probably at half the cost price; paying himself *in full* out of the proceeds, and handing over the balance, if any, to the other creditors, who in fact are the only sufferers, the tenant himself being no poorer than when he began?

Is it not, in the last place, a fact that, supposing the proceeds of the sale are insufficient to pay the rent due, the landlord, if he can discover any miller or other tradesman who has at any time within the two years, privately (or not at the open market or fair) purchased any portion of stock or crop, has the power of compelling such purchaser to pay over again the full amount of such purchase, although he had already paid it to the tenant?

WARTS ABOUT THE MOUTHS OF LAMBS.—I have a few lambs affected with sore mouths and warts on the nose. In both cases the warts consist of a mass of white roots and decayed matter, which is very painful to the lambs. Would you be kind enough in your next issue to advise me what is the best cure, and from what cause it arises? The lambs are grazed on young grasses, but there has been a great deal of wet weather.—Isle of Man. [The warts complained of probably depend, as you suppose, on the continued wet weather, and the consequent faulty state of the pastures. Possibly the wet herbage has caused some gastric derangement, or has been deficient in nourishment. Whilst the lips and mouth are sore, you should supply the little creatures with a daily allowance of a few ounces of linseed cake, or with some linseed gruel, bran mashes, or other such soft nutritive food which can be easily eaten. It will be well if possible to remove the lambs for the present from the wet grazings. If the lips continue sore and the warts are soft and disposed to bleed, they should be moistened daily with some mild astringent, such as a mixture of equal parts of Goulard's extract and glycerine.—VET. ED.]—*North British Agriculturist.*

THE ROYAL DUBLIN SOCIETY.—SPRING SHOW.

The Spring Show of the Royal Dublin Society was held on Tuesday, April 23, and the three following days, on the premises of the Society in Kildare-street, the scene, on former occasions, of so many sharp Shorthorn battles. There was no show held last year by the Society, in consequence of the threatened outbreak of the cattle-plague in Ireland, and it was feared that the result would be a great falling off in the number of entries this season, but such was not the case. The number of entries, particularly in the Shorthorn sections, was very large; the Shorthorn bulls, of all ages, reaching to 195, while at the last show held by the Society, in April, 1865, there were but 158, so that in this respect this show was in advance of the last.

The Dublin Spring Show has always been famous for the number and excellence of the yearling shorthorn bulls exhibited, and on the present occasion it certainly maintained its celebrity. There were 117 animals shown in this section, which, taken as a whole, were a choice collection, the equal of which could not be easily found; they were not, however, in such good condition, nor was the touch so mellow as at former shows—a fact which is accounted for by the uncertainty which existed amongst breeders, until a comparatively recent period, as to whether the Society would hold the show or not. The judges commenced their labours on Tuesday morning at 7 o'clock, and the yearling bulls were led out for inspection. The first prize was awarded to Sovereign, a roan bull, got by Royal Sovereign, the property of, and bred by, Mr. Richard Chaloner, Moynalty. Sovereign is a nice bull, with good hair and fine mellow touch: he is very good before, the shoulders being blended nicely into the crops. In addition to being awarded the first prize amongst the yearling bulls, Sovereign also carried off the *Irish Farmers' Gazette* Challenge Cup as the best breeding animal, of any age or breed, in the show. The second prize in this section was obtained by Mr. Francis W. Law, for his roan bull Birth-day Gift, got by Little Wonder, a fine animal, with good shoulder and deep roomy chest. Raspberry, a roan bull, the property of Lieut.-Colonel Fisher, carried off the third prize; the fourth going to Mr. Chaloner for his bull Cup Bearer. Drum Major, a bull with nice touch, belonging to Mr. Joseph Meadow, was highly commended, as was also Sir Allan Bellingham's roan bull Perfect, and Mr. Hewitson's white bull Squire Clyde. Two bulls, one of them a fine animal, belonging to Mr. W. Drummond Dunlop, were commended; Mr. Ambrose Bole's Prince George was also commended.

In the section for two-year-old shorthorn bulls there were 57 entries. The first prize went to Mr. Edward J. Smith for his roan bull Lictor, an animal with good forequarters and well-sprung ribs. Lictor, in addition to the first prize in his class, also carried off the Irish Railway Challenge Cup value £150, as the best bull of any breed, over two years and under five. Lictor is by Master Harbinger (18352). Mr. Low carried away the second prize in this section with his white bull Hoar Frost, a nice even animal, with good shoulder and rib. Hoar Frost is full brother to Birth-day Gift: they are both by Little Wonder (18204), out of the same dam. Mr. James Anderson's Squire Harbinger was awarded the third prize: he is a nice bull, with good shoulder, deep chest, and well-sprung ribs; he wants a little behind the shoulder however. The commended animals in this section were Mr. Anderson's Dictator, Mr. Chaloner's Bright Spear, a roan bull of Mr. Drummond Dunlop's, and a very fine roan bull, Earl of Kildare, the property of Mr. Nathaniel Barton. Earl of Kildare is by The Friar (20954), and is descended from Fourth Duke of Thorndale: it was the general opinion that he should have got something better than a commend, as his back, ribs, and hind-quarters were excellent.

In the aged bull section, which includes all animals of three years old and over, there were 23 entries. The first place was given to Mr. Robt. G. Cosby's Ravenswood, got by Nobleman out of Bride of Lammermoor; he is four years old, and got the first prize as a yearling at the Spring Show in 1864, and the second as a two years old in 1865. The second prize was awarded to the Marquis of Drogheda for The Champion, a fine massive bull, very good before. Mr. Moffatt's White Chieftain obtained the third prize: this bull stood first at the Clonmel Royal in 1865. Sir R. Gore Booth's Brilliant Lamp was commended. Amongst the animals in this section not noticed was Mr. Edwd. J. Smith's Chief of Lothian, which stood first as a yearling at Clonmel in 1865; also, The Friar, belonging to Mr. N. Barton, got by Fourth Duke of Thorndale (17750). It was the opinion of many that The Friar should not have been passed over. He is a bull of great substance, with grand shoulders, back, and ends. Mr. Ed. J. Smith's Backwoodsman was also a very good even bull.

In the yearling heifer section there were 17 entries, Chansonette, a nice red-and-white heifer with good hair and full crop, the property of Mr. Joseph Meadows, being awarded first prize. Chansonette is by First Fiddle (19749). The second prize went to Mr. Anderson for his heifer Gamehen the Third, by Mercury (22343), and the third prize was awarded to Mr. Richard Welsted's roan heifer Bridesmaid; she is descended from Roan Oxford (16841) and Third Duke of York, and was unquestionably the best animal in her class, and should have occupied the first place. She had a capital coat of hair, and her hind-quarters could not be surpassed, being wide and well set. The fourth prize went to Mr. Joseph Meadows for his red-and-white heifer Fanny the Nineteenth, half-sister to the winner of the first prize, and a nameless roan heifer belonging to Mr. John Cooke was commended.

In the section for the best Shorthorn two years old heifer, in-calf, or producing a live calf within twelve months after the date of the show, there were but five entries. The first prize was carried off by Mr. Anderson with his Octavia the Third, by Master Harbinger (18352), a nice animal, not in too high condition, as is generally the case with cattle sent to exhibitions. The second prize went to the Right Hon. Viscount De Vesci for his roan heifer Marchioness of Lothian, by Crown of Lothian (19533). Viscount De Vesci was also highly commended for his Flower of Athol, also by Crown of Lothian. The prize for the best short-horned heifer calved in 1864 giving milk or in-calf, was awarded to Mr. Welsted for Rosette, a fine roomy deep-barrelled heifer, got by Elfin King (17796).

In the section for short-horned cows of any age which shall have had a living calf within twelve months preceding the show, or shall produce a live calf within six months after the show, there were 14 entries, and the first prize went to Sir Allan E. Bellingham, Bart., for his cow Myrtle the Eighth, by Volunteer the Second. The second prize also was won by Sir Allan with his red and white cow Dewdrop, a good cow, descended from Duke of

York (12782). The Maid of Rocklands, belonging to Mr. Barcroft, by Duke of Geneva (19614), was highly commended, and Mr. Smith's Rose of May was commended.

Amongst the miscellaneous breeds, the Herefords stand first in the catalogue. The prize for the best yearling Hereford bull was won by Mr. Richard Fetherstonhaugh with Corduroy; and The Beau, the property of Mr. P. J. Kearney, was commended. The prize for the two-year-old Hereford bull was awarded to Mr. Kearney, as was also that for the best bull over two years old. The prize for the best Hereford cow of any age was won by Mr. Kearney. In the Polled Angus sections, Mr. William Owen obtained the prize for the best bull more than two years old, and also for the best Polled Angus cow of any age. In the Devon sections, the prize for the best yearling bull went to Sir A. E. Bellingham, and the prize for bulls more than a year old was awarded to Mr. Charles Boyle; a bull belonging to Mr. Charles Toole being commended. In the Devon yearling heifer section, Mr. Charles Boyle carried off the prize, as also the prizes for the best Devon heifer three years old giving milk or in calf, and for the best Devon cow of any age: in the latter section, a cow of Mr. Thomas Drury was commended. In the Kerry sections, the first prize for the best Kerry bull of any age was awarded to Mr. Ralph S. Cusack, and the second to Captain Daniel Bayley. The prize for the best Kerry heifer two years old went to Mr. Thomas Butler, and that for heifers three years old giving milk or in calf was awarded to Captain Daniel Bayley. The first prize for the best Kerry cow was won by Mr. James Brady, and the second by Captain Bayley: another cow belonging to Captain Bayley was highly commended, and one shown by Mr. James Smith commended. The prize for Alderney bulls more than a year old was awarded to Mr. George Dingwall, a bull belonging to Mr. H. Leachman being highly commended. Mr. J. Smith won the prize for the best Alderney heifer giving milk or in calf, and the prize for the best Alderney cow of any age went to Mr. George Dingwall. It will be seen from the foregoing that the prizes in the miscellaneous breeds are distributed amongst a few exhibitors. This results from the prizes offered—silver medals; while in the shorthorn classes substantial prizes of £15, £10, and £5 are given; and until the society places the miscellaneous breeds on an equality with Shorthorns as regards prizes, the exhibitors in these sections will always be few in number. So manifest a partiality is altogether unfair.

In the class for fat cattle, the prize for the best two-year-old shorthorned ox went to Mr. Nathaniel Barton, and that for the best shorthorned cow of any age to Christy Brothers, Mr. John Jameson coming in second. The first prize for the best fat shorthorned heifer not exceeding four years old was awarded to Major Burrowes, and the second to Mr. Allan Pollok. Mr. R. S. Fetherstonhaugh obtained the prize for the best Hereford ox more than three years old, which animal was also awarded the prize as the best of all the prize fat oxen. The prize for the best fat Hereford cow of any age went to Mr. Richard W. Reynell, the same animal obtaining the prize as the best of all the prize fat cows. The prize for the best Devon ox was won by Mr. Samuel Garnett. Mr. R. W. Reynell obtained the prize for the best Kerry ox, and Mr. Richard Manders that for the best fat Kerry cow. The prize for the best fat Kerry heifer went to Mr. R. S. Fetherstonhaugh, the same animal winning the prize as the best of all the prize fat heifers. The prize for the best fat Ayrshire cow was awarded to Mr. Nathaniel Barton, and that for the best heifer to Mr. Samuel Garnett. The prize for the best cross-bred ox went to Mr. James McOwen.

The entries in the sheep sections were not numerous, but those shown were very good. The spring is not a suitable time for showing sheep; and it is the intention of the society to establish a show for sheep alone, to be held in the autumn. The prize for the best one-shear Leicester ram went to Mr. Owen, a gentleman celebrated for his Leicesters; a splendid ram, which ought to have stood first, being commended, the property of Mr. Loftus H. Bland. The prize for the best two-shear Leicester ram also was given to Mr. Owen. The first prize for the best three Leicester hogget rams went to Messrs. McLachlan and McCulloch for a pen of Border Leicesters, and the second to Mr. Owen for a pen of pure-bred Leicesters. The prize for the best five Leicester ewe-hoggets was won by McLachlan and McCulloch with a pen of Border Leicesters; a pen of Leicesters belonging to Mr. Mowbray being commended. Mr. Ambrose Bole obtained the prize for the best pen of three long-woolled hogget rams. Mr. Chas. W. Hamilton was awarded the prize for the best one-shear Shropshire Down ram, and also that for the best two-shear. The first prize for the best pen of three Shropshire Down hogget-rams went to Mr. Hamilton, Mr. J. L. Naper coming in second. The prize for the best two-shear short-woolled ram went to a Shropshire belonging to Lieutenant-Colonel Tottenham. In the fat sheep sections, the prize for the best pen of five long-woolled wedders not exceeding one-shear went to Mr. Allan Pollok, as did also that for the best pen exceeding one-shear. The prize for the best pen of five fat short-woolled wethers exceeding one-shear went to Leiutenant-Colonel Tottenham for a pen of Shropshire Downs; a pen of Cheviots belonging to Lord Clermont being commended.

The show of pigs was not so great as it has been on former occasions; but the quality of the animals exhibited was really excellent. In the section for the best coloured boar, over six and under twelve months old, both the first and second prizes were carried off by Lord Clermont. The first prize for the best breeding sow in pig, or having had a litter within six months, was awarded to Mr. W. H. Massy, the second prize falling to Mr. William Joyce. For the best three breeding pigs, of the same litter under ten months old, both the first and second prizes went to Mr. Joyce. The first and second prizes for the best litter of not less than six over five months old, accompanied by sow, were also carried away by Mr. Joyce, with two splendid pens of Berkshires. In the white breeds, Mr. J. L. Naper was awarded the first prize, for the best boar over six and under twelve months old, for a Yorkshire and Cumberland boar. Mr. J. L. Naper also obtained the prize for the best boar under twenty-four months and over twelve, Lord Lurgan being awarded the second. The first prize for the best breeding sow was given to Mr. Naper for a nice sow of the white Yorkshire and Cumberland breed, as was also the second prize in the same section, Lord Lurgan receiving a high commend. The prize for the best three breeding pigs, of the same litter, under ten months old, fell to Mr. Naper for a pen of white Yorkshire and Cumberland. Mr. William Duckett got the prize for the best fat pig of any age or breed, with a large Yorkshire sow.

The Judges were, for Shorthorns, R. Stratton, Stapleton, Bristol; H. Thurnell, Royston, Herts; E. Bowley, Liddington House, Cirencester. For other Breeds of Cattle, G. Hewson, Listowel; J. Borthwick, Carrickfergus; H. Haywood, Blake House. For Sheep, T. C. Boothe, T. Garde, and J. Simpson. For Pigs, J. C. M'Clintock, J. P. Tynte, and J. Borthwick.

The show of implements was pretty good, all our chief implement - makers being represented. First in the catalogue stands the collection of Messrs. Howard, who exhibited a large collection of ploughs, harrows, horse-rakes, and haymakers; Messrs. Brigham and Bickerton, of Berwick, showed the patent Excelsior self-delivery reaping machine, also the patent Buckeye Junior, a combined reaping and mowing machine; J. W. Bradford, March, Cambridgeshire, showed horsehoes and washing machines; Mitchell and Burgess, Hunt-street, Manchester, exhibited emery composition files for sharpening reaper knives, for which purpose they appear to be most suitable; Messrs. Carson showed examples and patterns of their anti-corrosive paint; Messrs. Hancock, Tipton, Staffordshire, exhibited a various assortment of patent prize butter machines; James Eastwood, Blackburn, Lancashire, exhibited his well-known compound-action churns; Messrs. Richmonds and Norton, Liverpool, exhibited a large and varied collection, including their celebrated chaff-cutters, reapers, and haymakers; Messrs. Garrett exhibited portable steam-engines and combined thrashing and double-blast machines, also their well-known corn-drills and horse-hoes; Messrs. Picksley, Sims, and Co., had a large collection, including chaff-cutters, reapers, horse-rakes, &c.; Bradford showed his washing machines in all varieties and sizes; R. Hornsby and Sons showed some beautifully-finished reapers and ploughs; W. N. Nicholson, Newark-on-Trent, exhibited haymakers and horse-rakes; Messrs. Ashby and Jeffery exhibited their well-known haymakers; R. Boby, Bury St. Edmunds, showed haymakers and his self-cleaning corn-screens; and Messrs. Ransomes and Sims showed horse-rakes and ploughs.

PERMISSION TO EXHIBIT STOCK AT THE COUNTRY CATTLE SHOWS IN 1867.

The following is from *The Gazette* of Friday, May 10th:

Whereas divers Orders have been made by the Lords of the Council in relation to the Cattle Plague, which were consolidated and amended by an Order bearing date the 24th day of March, 1866, which Order has been altered and extended by subsequent Orders:

And whereas by the said Order of the Privy Council, it was ordered that no exhibition of cattle should be held until the first day of June last, which time has been since further extended by an Order of the said Council until the said Lords should otherwise order:

And whereas by another Order, bearing date the 8th day of August, 1866, the Lords of Her Majesty's Privy Council did prescribe certain forms of licence to be used for the removal of various animals.

And whereas by an Order, bearing date the 13th day of November, 1866, the said Lords did make certain provisions for the holding of exhibitions of fat stock intended for slaughter immediately after such exhibition, and it is expedient that provisions should also be made to enable local agricultural, or other societies to hold exhibitions of animals, whether intended for immediate slaughter or otherwise:

Now, therefore, the Lords of Her Majesty's Privy Council do hereby order as follows:

1. From and after the thirteenth day of May, one thousand eight hundred and sixty-seven, exhibitions of animals, whether intended for immediate slaughter or otherwise, may be held in any county in England and Wales, with the licence of the Lords of the said Council: Provided that no such licence shall be granted unless their Lordships shall be satisfied with the regulations under which such show is held, and that no case of cattle plague has occurred in the county where such exhibition is to be held within four calendar months prior to the date of such licence, nor unless the exhibition is situated at a distance exceeding thirty miles from the outward boundary of any place declared to be infected according to the provisions of the said Order of the 24th day of March, 1866, and continuing to be so infected.

2. Every licence so granted shall be revocable at any time by the said Lords of the Council.

3. When the Lords of Her Majesty's Privy Council shall under this Order license any exhibition of animals intended for immediate slaughter or otherwise, such animals may be moved to the place of such exhibition from any place situate within the county where such exhibition is held, with a licence in the form set forth in the above-mentioned Order of the 8th day of August last, for the store stock licence, with the declaration and certificate thereto annexed, but not without it; and the person bringing such animals to the exhibition shall deliver the said licence to some officer approved of or appointed by the Local Authority for the purpose of receiving the same thereat, and the said licence shall be numbered, detained, and carefully kept and recorded by such officer.

4. Provided that no animal shall be admitted to such exhibition from any place within twenty miles of which a case of cattle plague has occurred during the four calendar months previous to the holding of such exhibition, nor from any place situated out of the county within which such exhibition is held.

5. Provided also that each animal on entering and leaving such exhibition shall be examined by a duly qualified veterinary surgeon, appointed by the society holding such exhibition, and approved of by the local authority; and if any animal upon such examination shall be certified to be suffering from contagious or infectious disease, it shall not be permitted to enter such exhibition, but shall forthwith be slaughtered; and if any animal which may attend such exhibition shall be found to be suffering from any such disease, it shall not be removed alive from the place where the exhibition is held, but shall be forthwith slaughtered.

6. No animal exposed in such exhibition shall be moved therefrom to any place, except with a pass or licence, to be given by the officer who shall have received the licence as aforesaid to the person desirous of moving the same, in the following form:

EXHIBITION PASS.

Exhibition of the Society, held at in the county of

Date

The following animals, belonging to being of those brought to this exhibition from under the licence No. , and retained by me, may be moved to the following premises occupied by by the undermentioned route:

Number and Description of Animals.	Name of Occupier and Address and description of Premises to which the Animals are to be moved.	Route.	Name of Drover.	Remarks.

This pass expires on the day of , 186 .

[No animal can be moved under this licence upon any highway between sunset and sunrise.]

(Signed)

Appointed to receive licences and grant passes in the above-named place of exhibition.

NOTE.—Any person who forges or alters any licence, or offers or utters the same knowing it to be forged or altered, will be liable to a penalty of £20, or to be imprisoned, with hard labour, for the term of three months. See 29 and 30 Victoria, cap. 110, sec. 10.

MILLS AND MILLING.

WASTE AND ECONOMY IN DRESSING AND COOLING FLOUR, FROM 1852 TO 1865.

Our last paper concluded with the miller's reply that there was little or no novelty in the proposition of cool-grinding to obviate the threefold loss—of heated stive being carried off by steam, of pasting in various parts of the mill by the condensation of the steam, and of the deperdition of the odorous and sapid properties of the flour. First, because many millers have strictly adhered to the slow practice of cool-grinding, however increased were the demands upon their stones; while others had no necessity to follow any other course, the demand upon their mills being under what they could perform. Second, because to do less, or even an equal quantity of work, with improved and vastly more expensive machinery, would not pay, and therefore was incompatible with the profit-and-loss maxims of trade. And third, because, in ninety-nine cases out of the hundred, the multiplications of millstones to meet the multiplication of mouths was, as yet, an impracticable rule; for competition in trade had, during the last twenty years, literally become a life-or-death struggle, so that millers had no alternative but to go into it, and either do or die.

The commercial story of the miller is thus soon told. It is also plain enough to be practically understood by all engaged in milling; but the problem of the pioneer of progress has a much greater length and breadth. To him, starving or over-doing the miller, and killing the flour, are the elements of life; for he experiences no difficulty in adding a new wing or storey to the old mill, with motive-power amply sufficient to actuate as many additional pairs of millstones as the increase of population and trade may require, or to erect a new mill altogether on vastly improved principles, should the miller offer to turn-tail in the onward up-hill race. And besides, in 1864, two inventors (Yorkshire millers) made the discovery, and applied for a patent to the effect that the old invention of a millstone case was altogether from first to last a mistake, upon which no improvement could be made, and that millstones would do more work, and grind cooler, were the flour allowed to fall over the bedstone all round into a large cylindrical communication leading directly downwards to the trough, sufficiently capacious to obviate pent-up heated breath about the runner, thereby obviating the injury to the flour arising therefrom; but the project did not go to the Great Seal, the two millers having probably discovered that they had been anticipated. To make a long story short, the discovery is one of those which has several times been patented under the old statute, but with considerable mechanical diversity in the *modus operandi* of carrying it out into practice.

It will thus be seen that in the estimation of some practical millers, as well as in compliance with applied science in milling, the economy of the flour under consideration is a practical question whose solution takes us back to the quern of our ancestors and other mills of primitive times, and the improvements they have since undergone. In other words, there cannot be a doubt that the heating and injury of the flour in many mills is partly owing to its confinement in the millstone case; that this case conduces to the heating of the stones in more ways than one—*first*, because of the confined atmosphere; *second*, because of the friction of the flour between the periphery of the runner and the case; and, *third*, because the pneumatic pressure of the heated air in the millstone case, together with the flour, counteracts the effluent current of air and flour from between the stones. And if we add to these three the greater weight and velocity of the modern runner, as compared with the runner of the ancient hand-mill or quern, we have five causes to investigate, in order to account for the damage done to the flour, and, *per contra*, five causes which must all be removed before the economy under consideration can be practically effected.

Alcinous (an ancient poet tells us) had fifty maids—

> "Who warbled as they ground their parched corn"—

two at a mill, thus working twenty-five pairs of stones. The picture is no less historically interesting as to the practice of milling in patriarchal times, than it is instructively suggestive of future progress in modern times. The Hebrews in travelling from Egypt to Canaan must have had a great many mills grinding manna every morning, the whole number forming a larger manufactory than England erected on board ship at Balaklava. The armies of Greece and Rome likewise carried their mills with them, so that the grinding for their legions was a work of some magnitude, and in all these cool flour and no millstone case was the order of the day.

We have no reliable account of the velocity of the runner of the Celtic quern or "Hebrew chariot;" but taking the diameter at 18 inches, and allowing one revolution per second, and further taking the actual grinding surface to be the outside ring of six inches; then from such data the common velocity would be about 4 feet per second, or 240 feet per minute. The velocity of our modern runners exceeds this so far, that were we writing exclusively for millers, we should prefer leaving them to make each his calculation from his own stones. According to book-rule deduced from the experiments of the last century, the velocity should be from 15 feet to 20 feet per second, or from 900 to 1,200 feet per minute.

Such a difference in the velocity of the grinding surface of the runner demands a closer and much more extended experimental investigation than it has yet received. We put a high value upon the experiments of last century, and also upon many which have been made since 1800; indeed, their value is inestimable. Let us not be misunderstood on this point; but they all fall short on practical details, involving questions which were considered either unworthy of experimental solution, or which were not dreamed of at all at the time such experiments were made. There is no want of experiments with patent projects; but these, for the most part, are of a party character, and comparatively useless for any scientific purpose. In the second edition of his work on "Mills and Millwork" (1864) Mr. Fairbairn quotes a modern experiment, no doubt familiar to most of our readers, viz., the Government Deptford experiment, relative to the aëration of the millstones along with a stive room. We shall take this Deptford example in order to show its shortcomings, and how worthless it is for any scientific or practical purpose, beyond the example itself. First, by the use of this patent the Government mills could grind double the quantity of flour; the temperature of the flour was lowered some twenty degrees, so that it was fit for immediate bolting and sacking up for the baker; the value of the flour, too, was greatly enhanced, and the atmosphere of the mill purified by the removal of the stive. Now, the professional reader will readily perceive that these data being only of a comparative kind, indicating two conditions of the same mill, it follows that the amount of the improvements made is entirely dependent upon the former condition of the Deptford mills. And as we have many reasons for believing that the said Deptford mills were, like most Government mills, bad ones, the latter experiment may only indicate the results of common successful practice. If, in the first place, the Deptford mill, prior to the use of the patent, only ground, like many other bad-going mills, half the quantity of flour in a given time which some good-going mills did without the patent, and something less than other mills with better patent and ventilating apparatus; if, in the second place, the flour from the Deptford old mill was some 20 degrees higher in temperature than under the common system of good-going mills, and the economy of the stive corresponding, as it generally does—what, we should like to ask, is the value of the experiments? or of the patent, as compared with other patents? That American flour-pumps, or an exhaust rotary fan, will carry off heated air and steam, thereby lowering the temperature of the flour to a degree fit for immediate bolting, and, at the same time, facilitate grinding, may be taken as facts proved fifty times over. But the truly practical and scientific reader will perceive that all this is only proof in the wrong direction; for the old hand-mills produced no appreciable quantity of heat or steam, and very little floating stive, unless when the meal was ground a second and third time, a practice which has from time immemorial been condemned, as has already been shown, on account of its killing the flour and so forth. If no caloric is liberated, no steam can be produced; so that the effluent current of air and flour will flow from the stones very little elevated in temperature above the influent current of air and wheat; the flour, as it falls upon the cloth around the hand-mill stones, being cool and fit for immediate sifting and sacking. And, if such was the successful result of hand-mill grinding in camps and capitals, where upwards of a hundred thousand mills were in daily use, why should it be otherwise with steam and other power mills now in use? Why kill the flour when it can be kept alive by cool grinding on the old plan? Why do modern millers waste the natural sap, odorous and sapid properties of their wheat and the finest of their flour in the form of floating stive in their mills, thereby procuring for themselves the very appropriate *sobriquet* of "dusty miller," when the ancient Chaldeans, Hebrews, Egyptians, Phœnicians, Carthagenians, Greeks, and Romans, &c., utilised the whole, and sold it for sterling money?

Interrogatories of this kind may readily be put by the bushel, but practically speaking they are not in all cases so easily solved. The intelligent miller, who has been able to follow us throughout the above argument, will perceive that the first improvement upon the hand-mill in its conversion into a power-mill involves the weight, diameter, and velocity of the runner and the number of pairs of millstones required to produce a given quantity of cool flour, sufficient to supply the demand upon the mill, and that without any waste. It is just as easy, scientifically speaking, designing a steam, wind, or water mill, with a hundred thousand small 18-inch diameter runners, each moving at the rate of from 10 to 60 revolutions per minute, as a hundred 4-feet runners each moving at the same number of revolutions in any given time. At one time, or when donkeys were first yoked to the runner, there may have been mechanical difficulties in the way, and even after wind and water power were applied; but now there is none. This brings us at once to the professional labours of the miller, who has now to count his millstones by hundreds and thousands instead of by units and tens, and attend to the economy of the flour. And here we find his toil infinitely less than at present and of a much more elevated character; for the inventor has so designed his new mill that steam, wind, or water (as the case may be) and machinery do everything for him, even to the dressing of the millstones and the economy of the flour.

"But is the writer really in earnest?" some old-school companion may ask; "or is he simply discussing the question of progress—taking millers back, as it were, to the time when donkeys were first yoked to the Hebrew chariot purposely to show them the march of improvement up to the present day, and how they have recently gone off the line at a shunting, and so forth?" The latter of these interrogatories will be disposed of in another paper. In reply to the former, we have said "18-inch runners" simply because such were in use when cool grinding was the common practice. And when donkeys were yoked to the runner its weight and diameter was greatly increased, but its velocity was decreased. True, intermediate gearing was invented at a very early date, for increasing the velocity of the runner; but when such was adopted, the weight of the runner was chiefly borne by the rynde pivot or spindle. The runner of decorticating or shealing-mills was also supported on the pivot on which it turned so as to prevent grinding. It also moved at a less velocity than the runner of a grinding mill, the draught-bars to which the donkeys were yoked being generally fixed radially in the runner. We aver, however, that the old ass-mills for grinding always moved at a slow velocity, so to speak, as the meal from them retained its natural strength. Hence the reason why the ecclesiastics of Canterbury preferred the flour of the old ass-mill to that from wind and water-mills. And what is more deserving of notice is the fact that the ancient runners not only moved at a less velocity than modern ones, but without being confined in their grinding, fanning, and centrifugal actions in a comparatively close millstone case, in which the flour has to be brought round to the mill-eye shute by the friction of the periphery of the runner. In short, the flour often suffers more harm between the runner and case than between the runner and bedstone: hence, when millers, about the middle of last century, began to enlarge the millstone-case so as to permit of a vane or sweep being put upon the periphery of the runner for keeping the millstone case clear, the stones in many cases did double the work, producing cooler and stronger flour, and at a less expenditure of motive-power and tear and wear upon the mill. Mortimer, who wrote about the commencement of last century, says that in his time many "ingenious attempts" were beginning to be made in order to improve mills in this respect, "both in the framing and ordering of the water-works, and in the contrivance of the mill itself, which doubtless goes much heavier by the stone they call the runner, it being so large, and being encompassed with a hoop or case that keeps the meal to the edge or circumference of the stone, and much deadens its motion; for the larger the runner is, the heavier it moves, which may in some measure be remedied by making four or five vents or passages in several places of the hoop, to take off the meal as fast as it is ground, that none may be to clog the runner." There is sound philosophy in this quotation, as there is in all the writings of this old author, who saw that the clogging of the runner not only increased the consumption of motive-power, and reduced the quantity of work done, but also killed the flour: hence the nature of the remedy he proposes.

The reader will thus perceive that we purposely leave the diameter, weight, and velocity of the runner an open question, for experimental solution, as formerly suggested—a question which, up to the present day, has not been satisfactorily solved. Since Mortimer's time, the diameter has been reduced, but the velocity has been increased; while at present, probably, the majority of mills are yet grinding with clogged runners, and less or more injured flour, as in Mortimer's time. In the quern there was nothing to retard the centrifugal and fanning action of the runner, and the uniform effluent current of air and flour from between the stones; but in this modern example the reverse of all these conditions is the rule. The flour between the stones and the case retards the runner, the effluent current of air and flour almost putting a veto upon the centrifugal and fanning action of the runner, and doing, *in toto*, an amount of mischief which the English language fails to express in suitable terms.

To take the miller to the opposite end of his mill, and there lecture him about the economy of stive, &c., by this and the next patent, while his millstones are grinding thus, would be something worse than mockery, whether things are viewed in a practical or scientific light. What the miller, under such circumstances, evidently requires is, cool grinding, and the utilisation of all his cool flour, as it issues from his stones, without any waste whenever; and when we come to examine modern projects, in answer to the second of the above two interrogatories, we shall find many more shortcomings than have yet been noticed, with much to suggest future improvement, the grand object we have in view.

The world has had cool grinding longer than it has yet had heated breath in the millstone-case, with clogged runners, killed flour, &c.; and, with all due deference to our modern pioneers of progress, the true course of improvement is to go back, and begin where our ancestors left off, and bring up the march of progression, without producing either heated air, steam, or floating stive in the mill, cool grinding being the rule all the way through.

THEORIES AND PRACTICES THAT STAND IN THE WAY OF PERMANENT PROGRESS.

We have briefly reviewed some of the leading points in the cooling and dressing of flour, the heavy waste generally experienced under the present system of hot grinding, together with the growing wish to obviate this loss, and the conclusion was not favourable to the cause of permanent progress. In other words, although many and great improvements had been made during the last fifty years, much of this improvement was based upon an unstable foundation, and that millers would have to go back to the simple times when cool grinding was the rule, and there begin the race *de novo*, without shunting the mill-van either to the right or left of the main line. In our present paper we have to examine the shortcomings of the past from a scientific point of view, for the twofold purpose of showing (*first*) that the above conclusions are well founded, and (*second*) that there is good hope ahead for millers.

The general question is one of cross purposes—viz., cool-grinding *versus* hot-grinding, or cooling the millstones and flour. To the superficial observer this mode of putting the general question may appear enigmatical; but a very little reflection will suffice to show that the contrary is the case; for, in solving the problem of cool-grinding, millers are evidently putting the mill-cart before the horses! In other words, cooling the millstones and flour being a negative mode of expression, it follows that the millstones and flour must first be heated before they can be cooled; so that the modern practice of cooling the millstones and flour is hot-grinding and not cool-grinding. Hence, the fallacy of the modern proposition of cooling the millstones and flour.

And this is not the more anomalous view which must be taken of this modern fallacy in milling; for forcing in an extra pressure of air, by fans between the grinding surfaces of millstones, for the purpose of cooling them, may actually produce the opposite or contrary effect; *i. e.*, the air thus added may increase the amount of heat produced. In point of fact it does not, as will be shown in its proper place. The air, or "current of air," as it is credulously, but erroneously called, thus incorporated with the grain and flour, is, no doubt, a successful means of carrying heat; but heat must exist before it can be thus removed from the millstone-case; and if more is actually removed, that is proof positive that more is produced in the grinding, and so forth.

It will no doubt be said, in reply to this, that although the air, like water and other fluids, is subject to similar laws, and that if water by making it revolve some 232 times per minute can be raised to a temperature sufficient to boil an egg, so air between revolving millstones can also be raised in temperature; yet there is a difference between the two, which is in favour of keeping down the temperature of the air, especially when it is incorporated with the flour, as in this case it will reduce friction, like grease upon the axis of the mill-wheel. And besides this, air, from its elastic and expansive character, actually forces the finer particles of the flour out through the coarser particles into the millstone-case, thereby preventing "killing," &c. Such, in point of fact, are some of the doctrines taught by our modern pioneers of progress.

Objections of this kind hardly merit a formal refutation, as the reader will readily perceive that they are all beside the question at issue; for the contrary hypothesis is involved in the proposition of cooling the millstones and flour. That a proper supply of air is conducive to cool grinding no one will deny, who has any experience in milling, even with a small family mill, or with any of the power mills now being used for rough grinding in the feeding of live stock; but cool-grinding is one practice, and hot-grinding another, and the latter is the practice under present consideration.

To avoid misunderstanding on the facts of the case at issue, let us take, in a short paragraph, a retrospective view of the whole from the commencement, as stated in former articles. Thus, in grinding with the quern, heat was obviously produced; but, from the plentiful supply of air along with the grain, and no check to the influent current of grain and air, and effluent current of flour and air, the heat was carried off with the air, so that no appreciable increase of temperature of the flour was experienced. In this case, the velocity of the runner was under four feet per second; and when cattle were yoked to a cross-bar fixed in the runner, the velocity must have been considerably less, but the weight of the stone was increased. At present, the velocity of the runner is at least five times that of the above. The millstones, from the improvements made in machinery, are now set breathlessly close together; while the stones are confined within a close case, the case being set sufficiently near the periphery of the runner, so that its roughness may bring round the flour to the mill-eye spout. In those rude times this was, no doubt, considered a great discovery. The consequence of this was the clogging of the runner, not only on the edge, but often, in very bad examples of hot grinding, on the top of the runner also. The effluent current from between the millstones was thus shut, and consequently the influent current too; so that, to make the mill work, the velocity must be increased to a degree sufficient to acquire a momentum to force the flour out at the mill-eye spout. Hence the conclusions at which Ferguson and others arrived, relative to the velocity required for successful practice. To this practice, noticed by Mortimer and other old authorities on the subject, there were no doubt many exceptions, where the clogging of the runner was obviated by various means, and the old practice of cool grinding by a slow moving runner preserved; but it was, nevertheless, the common rule—or, to speak in the mildest terms compatible with the exigencies of the case, a very common rule—when the modern progress of cooling the millstone and flour were first reduced to practice.

Now in this *resumé* of the march of improvement two false steps are taken, to which special attention requires to be paid at the present time. The first of these departures from sound improvement was the confinement of the runner in a close case, and the second is the increase of velocity given to the runner so as to clear the case, and thus effect successful practice in grinding—250 revolutions per minute being considered no extraordinary thing by some millers, but the half of this is perhaps the more common rule for quick driving, and a hundred revolutions the common rate. The difference between such velocities and those of the old ass-mills, which could not make above three or four revolutions per minute, affords ample grounds for both experimental and scientific investigation.

It will, no doubt, be said that the process of grinding in querns and ass-mills is so totally different from that of grinding in our modern steam-mills that an increase of velocity in the latter is required to effect successful grinding. In the former, for example, the runner rode upon the grain being ground, which of necessity, as it were, involved a slow rate of driving. But when the runner began to be placed upon and revolve upon a pivot, intermediate gearing was found necessary to get up grinding speed; and now that runners revolve without deviating a hair-breadth from the truth, a further increase of velocity has become requisite to effect successful grinding.

The practical scope of the argument thus advanced may be admitted. But exactly the same plea may be advanced in support of the close millcase to keep the flour up to the action of the periphery of the runner, and the necessity to which this gave rise to increase the velocity and consumption of motive power so as to force out the flour at the milleye shute into the creeper or trough below. The argument, therefore, practically speaking, is tantamount to so many more departures from the true line of improvement; for the truthful hanging of the runner, and the increase of velocity necessary, to make up for weight of the runner thus removed from the grain being ground, simply means *hot grinding*, or rather cutting, as will afterwards be shown in its proper place.

Such is the whirlpool of contending elements into which the subject of cool-grinding *versus* hot-grinding resolves itself, and the greatest difficulty to getting clear out of this whirlpool is, the force of habit which attracts everything towards its vortex—taste, opinion, and everything else having acquired a sort of second nature, or abnormal condition adapted to the peculiar exigencies in which they are thus called upon by this centrifugal force of circumstances to exist. Indeed, such is the anomalous position of the milling trade in this respect, that it is very problematical if flour produced by the system of cool-grinding would now be relished by the public palate, so confirmed has the taste become to the produce of hot-grinding, together with the modes of cooking and baking to which it has given rise.

Time, however, tries every man's work, the miller's not excepted, and no doubt eventually public prejudice and confirmed habits as to modes of manufacture and quality of the flour will give way to the progress of things. Indeed, cool-grinding has already become the problem of problems in almost every mill in the kingdom, the round-about manner the pioneers of progress are working being the chief obstacle in the way of its speedy and successful solution. Mortimer, in his day (A.D. 1710), for example, proposed increasing the number of vents in the millstone-case, to prevent clogging; but he did not suggest a reduction in the velocity of the runner so as to obviate or do away with the cause of heating, and since the commencement of the last century, when he wrote, inventors with few exceptions have followed in his footsteps as it were, in their attempts to obviate heating, facilitate grinding, and to economise motive power, flour, and manual labour, some inventors enlarging the millstone-case, and then applying various devices to the periphery of the runner for cleaning out the flour, others using blast and exhaust fans, and like pneumatic apparatus, to effect the same end. The above author (Mortimer) also suggested vertical edge-grinding, so as to effect the same purpose; and a third class of modern inventors have followed him in this direction. To all these we have already turned attention, so that it will be unnecessary to allude to them individually again, a general example being all that will be required to illustrate the scientific data under discussion.

The cause of heating is the greatly increased velocity at which the modern runner is driven, as compared with the old practice of cool grinding, together with the greater length of time the wheat and flour are subjected to the action of this increased velocity within a closely-fitting millstone-case. In most of our cyclopædias and modern works on mills, the Government victualling mills at Portsmouth, Deptford, &c., are quoted and illustrated as examples; and we shall return to the Deptford mills of her Majesty and the experiments of the Admiralty, already referred to, in order to illustrate the details of the heating process, and the objectionable character of the hot-grinding system, with its modern, cumbrous, expensive cooling and economizing apparatus.

The Deptford mills' experiments may, for the sake of brevity and distinction, be termed the patent hot-grinding system *versus* the old unpatented hot-grinding system, in which the former, after a battle of several years' duration, or from 1847 to 1851, obviously gained the day, although it was the hotter grinding system of the two plans; but by carrying off the heat and steam, it produced the coolest and finest flour. The general advantages reported most favourable to the patent process by ventilation are those of October, 1850; in which it is said—that the stones do twice the work in a given time; perform four times the work before they require to be dressed; produce flour of a finer quality, and 20 degrees cooler, which can be bolted from the stones; and the floating stive in the mill is economized. In wading through the papers and experiments we were unable to arrive at these conclusions; but as they are favourable for illustration and argument, we shall allow them to pass muster.

In the unpatented process the runner made 120 revolutions per minute, doing, according to the above hypothesis, the same amount of work in two minutes that the patented process did in one. We are not told that the flour was twice the length of time in the millstone case; but we may infer that it was, so that it was subjected to the heat produced by 240 revolutions, as compared with the other, while the heat and steam produced by the latter are carried off by the exhaust fans. In the former example the periphery of the runner, and often the top, is working in a close body of flour, steam, &c., even with vanes on the periphery, improperly placed, so that the effluent current of air from between the stones is choked, whilst the stones must grind slow and heavy, and the flour be greatly heated and killed. Such being the objectionable state of the unpatented system, it is easily accounting for all its losses, and also for all the advantages gained by the patented example.

On the other hand, under the patented ventilating process, twice the quantity of wheat ground in a given time must liberate heat and produce steam in a corresponding degree; and as such are carried off by the exhaust fan, the cool flour is no argument in favour of cool grinding, but the contrary. The patentee in his papers even goes the length to prove that the heat and steam are so thoroughly carried off in the grinding and ventilating processes, that the flour is as dry and fit for export and foreign service as the kilndried flour of the nonpatented system, so that the hot-grinding is something extraordinary; but the Admiralty very prudently called in question the soundness of the patentee's proposition, and we apprehend that he himself did not see altogether its suicidal character. Had the percentage of moisture in the wheat and flour been determined, we should have had tangible data from which to ascertain, or approximate the amount of steam and heat carried off; but throughout the whole, the long course of experiments are so unpardonably wanting in scientific data of this kind as to render them of little or no value.

ON THE SOURCES OF HEAT IN GRINDING CORN.

The subject of Heat and its Effects in grinding Corn, from its great importance, demands a special consideration, in order that its details may be seen in their true physical light. There has existed, and still exists, no doubt, much diversity of opinion as to the nature of heat, some philosophers teaching one theory, and others a different one; but, so far as heat in grinding is concerned, it will be unnecessary to go into questions of controversy, the indications of the thermometer being, for the most part, a rule in milling sufficiently correct for both scientific and practical purposes.

There are three sources of heat that claim the attention of the miller—viz., (1) the temperature of the atmosphere in the mill; (2) the velocity and friction of the runner; and (3) the breaking-up of the kernels of the grain being ground into meal or flour: and the effects produced by these, under the hot-grinding system of milling now generally practised, as in the Deptford Mills, are (1) the conversion of a portion of the natural sap of the grain into steam; (2) the destruction or deperdition of odorous and sapid properties of the grain, with other chemical changes of a similar character; and (3) the destruction of the natural granulation of the flour, or the breaking-up of the fine particles of the flour into floating stive. The former three topics will form the subject of this paper, and the latter three our next.

(1). Of the temperature of the atmosphere little requires to be said, as there are few millers now-a-days who do not attend to the daily readings of the thermometer. In the olden times it was, no doubt, otherwise; "corny toes," rheumatics, the salt-cellar, with a hundred other prognostications, taking the place of the reading of the miller's thermometer, barometer, and hygrometer. Not a few intelligent, practical men, even at the present day, have perhaps as much faith to place in the old readings as in the new; and doubtless, at times, both are professionally consulted, if not absolutely required. A few degrees of temperature, up or down, wonderfully affect the grinding; and there is a secret in the art besides, for in ninety-nine cases out of every hundred the weathercock on the mill or kiln has something to say in the matter, the wind from certain quarters bringing moisture, &c. A low temperature has always been considered favourable to grinding, provided it is accompanied with a comparatively dry atmosphere; and a high temperature the contrary; the temperature of the flour in the two cases indicating a greater difference than what the atmosphere of the mill does, because the effects produced by the increase of temperature upon the grinding have to be added to the increase of temperature of the flour, other things (as the velocity of the runner and the feed) being the same. If there is, for example, a difference of twenty degrees between the temperature of the mill at one period and its temperature at another, in grinding two parcels of wheat of exactly the same quality into two qualities of flour also equal, the temperature of the mill in the one case being 40 deg., and in the other 60 deg.; and if we further suppose that the temperature of the flour in the former case is raised 10 deg., then that of the flour in the latter case will exceed 70 deg., because this increase of 20 deg. in the temperature of the mill and of the wheat (supposing the wheat to be of the same temperature as the atmosphere of the mill) conduces to an increase of temperature from the other two sources—the velocity of the runner and the breaking-up of the grain. To suppose no increase from these two sources would be to argue that summer and winter, hot weather and cold, are alike to the miller; which is contrary to all experience. What the actual increase of temperature may be will depend very much upon the ventilation of the stones and the hygrometrical state of the atmosphere, apart from its temperature. In practice, this increase is, of course, avoided as much as possible, by grinding slower, either by reducing the velocity of the runner and feed, or the feed only. But where no attention is paid to the change of temperature in the mill, the stones being driven in hot weather as in cold, and the same rate of feed supplied, the increase of temperature of the flour in question may be 5 deg., 10 deg., or even 20 deg. and upwards—*i. e.*, the flour in the latter (hot-weather) example would be 75 deg., 80 deg., or even 90 deg. and upwards, the total increase in the temperature of the flour above the temperature of the mill produced in the process of grinding being thus 15 deg. or 20 deg. or 40 deg., as the case may be, the lowest of these increases indicating a very destructive example of the hot-grinding system.

In the above hypotheses we have assumed the temperature of the wheat to be the same as that of the atmosphere of the mill; but such is not always the case: generally speaking, it is probably the exception rather than the rule. Indeed, in practice every case is considered its own rule. Thus the moistness or percentage of water in the grain will affect its temperature; so will difference of quality, the depth at which it is lying in the granary or garner, or the length of time it has lain in either; also the scouring and dressing of the grain preparatory to the grinding. In examples of kiln-dried corn, various rules were in the olden time laid down for summer and winter, north and south, varying from twenty-four hours to a week; but the use of the thermometer has discovered many shortcomings in the bye-laws of the old miller. In point of fact, they were never anything else than "*lip labour*" to himself, the hand of the miller being the thermometer of the olden time.

(2). Both the millstones generate heat, the runner by rubbing against the grain being ground and the atmosphere, and the bed-stone by being rubbed against by the grain. Both stones will increase in temperature if the runner is driven at a great velocity, although running empty, *i. e.*, grinding the atmosphere produces heat. Our modern "blast" and "exhaust" philosophers must not forget this when they begin to reduce their theories to practice, for the more air they grind in a given time the more heat will be produced, other things being equal. It has even been taught that "motion is transformed into heat," but we hardly understand the literal meaning of the dogma. In practice there is a contrary to this dogma; for when the runner becomes very hot, running it empty for a short time tends to cool it; *i. e.*, the cold air being ground absorbs the heat of the stones, in accordance with the familiar law of "a natural tendency to an equilibrium of temperature." But practical millers do not drive idle stones if they can help it, and therefore we need not provoke controversy under this head. The truth of our proposition, that both millstones generate heat, is universally acknowledged, the experience of all ages, from the remotest antiquity, leaving the miller no other conclusion.

The degree of heat produced by the stones in a given time by a given number of revolutions of the runner is of more difficult solution, owing to its being inseperably connected with the other or third source of heat, viz., the breaking up of the grain into flour. It is admitted, however, that heating increases with the increase of the velocity of the runner, and the area of the grinding surface in action; but the ratio of this increase is not yet a settled question, even where the quality of the grain being ground is uniform in all respects. The actual increase of the temperature of the stones that takes place could no doubt be measured by the thermometer. In point of fact, such is daily being done; but it affords no reliable evidence of the quantity of heat given off during the grinding of a given quantity of grain, but the contrary.

The temperature of the stones affords no small evidence as to their quality and manufacture, evidence which is beginning to attract more attention than it has hitherto received. No doubt this requires a certain amount of qualification, for from time immemorial millers and the manufacturers of millstones have been familiar with the facts in question, but the accurate measurement of the heat of the stones is a proposition of more recent date—one whose solution cannot as yet be said to be regularly effected, so as to do justice to all parties involved, and also to give fair-play to the cause of progress, the readings of the thermometer being, in the majority of cases, only rough guesses or distant approximations. That there are many difficulties in the way of the miller applying his thermometer to the grinding surfaces of his millstones must be granted; but difficulties of this kind will disappear as the practical importance of the question becomes more and more soundly appreciated. Millstones may be made each carrying its own thermometer, so that the miller can read off the temperature of his stones and also of the interior of the millstone-case, as he can now do the temperature of the atmosphere of his mill; and when we get this length, the rising and falling of the instrument will be watched with as much anxiety and professional skill as it is in many other branches of manufacture, where the thermometer may not inaptly be said to be the soul of success.

Different kinds of millstones are differently heated when moving at the same velocity and doing an equal quantity of work in a given time. Even stones of the same kind, or from the same quarry, are often different in this respect—apart altogether from their manufacture for use; while the art of manufacture has much to do with the heating tendencies of the stones, more especially those porous qualities that require to be filled up with artificial materials to give them the proper grinding texture and composition.

Some kinds of millstones generate and retain more heat than do others; while a different sort gives out perhaps as much heat, but retains in their structure less; so that the miller requires to know not only the temperature of the stones, but also that of the interior of the millstone-case, and likewise the temperature of the flour, together with the quantity of heat carried off by the effluent current of air, steam, and flour, and that which is given off from the surface of the millstone-case and spouting. And when he has ascertained all this, the question of how much heat has been reduced from a free to a latent state in the process of grinding calls for solution. Truly, the miller must be well versed in the philosophy of heat, in order to control the temperature of his millstones.

Much, too, of the heating of millstones depends upon the form, diameter, dress, and area of their grinding surfaces. In this country a common form is generally preserved; but of late there has been a greater departure from the old rule, without any definite standard having been adopted as a new one. The diameter is less than in the olden time: dress is getting more into the curved or Tuscan style. The real flour-grinding area is a ring of from six to nine inches or so in breadth towards the circumference; and this ring is now being made, if anything, narrower than formerly. These are interesting characteristics in the march of improvement, for they are obviously indicative of real progress being made on a permanent basis, the reduction in the diameter and in the breadth of the grinding surface-ring and the curved style of dress being all in consonance with the requirements of science. Thus, the decrease in the diameter of the stones increases the centrifugal action of the runner, and shortens the tangential path of the flour to the periphery, thereby lessening the liability to killing and heating, supposing the breadth of the ring to remain the same. Again, the reducing the breadth of the ring produces this latter desideratum, viz., the shortening of the tangential path of the flour outwards, from between the stones into the millstone case. The grain as it is ground, or while being ground, does not proceed outwards radially in right lines from the centre or spindle to the circumference of the stones; for if it did so, the breadth of a six-inch ring in a four-feet diameter stone would be equal to that of a six-inch ring in a five-feet or a six-feet stone; but when a tangent is drawn to a radius from the inner-part of the ring to the circumference in the two cases, the lengths of the tangents are very different, the greater diameter having the longer tangent; and so is the length of the path of the materials being ground, the grinding action to which it is subject, and heat produced, granting that the velocities in the two cases are equal. The action of a blast, or exhaust-fan, so as to produce a current of air between the stones, or a greater degree of "liveliness" in grinding, has a tendency to shorten the path of the flour outwards; but, to avoid repetition, the peculiar function, path, and action of air between the stones will be discussed under a different and subsequent heading.

The greater the quantity of corn ground in a given time, the greater the amount of free caloric or heat liberated, the velocity and quantity of the grain being the same. This increase of grinding-action and friction may arise from a different style of dress; or it may be produced by a current of air forcing the grain being ground more closely and firmly to the grinding surfaces, wedging it in, as it were, between them, thereby increasing the grinding-action or friction and heat. The heat thus produced by the stones may be less for a given quantity of grain than under a different style of dress or aëration; but in a given time it will be greater, with a greater quantity of corn ground, the millstones in both cases grinding lively, or free from clogging. If the millstones in the slow grinding example clog between and also in the millstone case, both on the edge and above the runner, as complained of by Mortimer in his time, and, we may add, by many since then, an increase of motive power and velocity must be resorted to, in order to make the runner clear itself and grind, so that motive power, velocity, the area of the grinding surfaces, and other things are unequal. And the less quantity of corn ground may produce more heat in a given time than the greater quantity of corn ground. Thus the heat produced by grinding 4 bushels per hour with an imperfect dress and ventilation, and also by clogging, may produce more heat than 8 bushels per hour, the stones grinding free and lively; but if the stones in the former case have the same dress and are grinding lively and free from clogging, then the stones in the latter case will set free the greatest quantity of caloric.

(3). In the grinding or breaking-up of the grain, the heat set free will be directly as the fineness of the flour, but inversely as the times—*i. e.*, 8 bushels per hour will set free a greater quantity of caloric per bushel than 4 bushels per hour, the velocity being uniform and the qualities of the grain and of the flour equal each to each respectively. And the increase of liberated heat will be greater per bushel if the velocity in grinding the eight bushels per hour is greater than that per bushel in grinding the lesser quantity of four bushels per hour.

Some of our milling readers may not at first sight recognise the facts of the case at issue under the above mode of expressing them: but a very little cogitation will suffice to bring them into view. In the superficial routine of common conversation, the heat produced by the breaking-up of the kernel into flour is very frequently overlooked altogether, the whole blame of heating the flour being laid upon the millstones; but this superficial mode of reasoning the matter will not bear being put through the mill a second time, if we may be allowed the comparison; for if the miller only asks the reason why he does this or that in regulating the feed, so as to reduce temperature or speed in grinding at any given velocity at which the runners are being driven, the facts of the case will speak out for themselves in language to the above effect.

Kilndried grain and wheat naturally dry, or that has been dried in the sun or by frosty weather, produces more heat in the grinding than soft samples containing a greater percentage of water; and the reason is, manifestly, the greater amount of friction in a given time amongst the particles of which the kernel is composed in the former case than the latter, partly owing to the greater solidity and compactness of the dry kernel, and partly owing to the swollen state of the moist or soft kernel, the water lubricating the particles, as it were, thereby reducing friction and heat.

ON THE EFFECTS PRODUCED BY HOT GRINDING.

There are three effects produced by heat in grinding, that require special attention. The *first* of these is the "*hot breath*," or steam produced in the process of milling; the *second*, the destruction or deperdition of the odorous and sapid properties of the grain, with other chemical changes of a kindred character; and the *third* is over-grinding, or the destruction of the natural granulation of the flour, or the breaking up of the fine particles composing the kernel, into floating flocculent stive. Such are the topics which will form the subject of this paper.

(1.) A grain of wheat absorbs moisture from the outside to the centre; thus, if a grain of dry corn is thrown into a tumbler containing water, it will soon begin to swell, thus showing the rapid absorption of moisture which proceeds from the surface of the kernel inwards to the centre, by a physical law that requires no explanation.

By the same law fine dry wheat, containing say, for the sake of argument, fifteen per cent. of water, if placed in a moist atmosphere will absorb moisture therefrom, so that the sample will eventually become soft, yielding an increased per-centage of water, first the outside of the kernel and then the interior, until a state of equilibrium is attained. In some localities the wind from certain points of the compass is always heavily loaded with moisture, so that the ventilators on that side of the granary and of the mill require to be shut; and for a similar reason in very muggy weather every opening is closed to keep out damp from the wheat. Hence the theory of the "Wheat-Canister" suggested by an eminent engineer, for the safe conveyance of wheat across the Atlantic and other seas, where cargoes in bulk are very liable to absorb moisture from the atmosphere.

And this too is not all; for wheat, when exposed to a muggy atmosphere, becomes not only soft but "*musty*," a moist atmosphere being almost always loaded with the spores of fungi and the life germs of a nameless number of microscopic little bodies besides, instinctively attracted by natural laws to the wheat as a means both of present subsistence and of propagating their future species. Hence the practice of fumigating granaries and garners and every other part of the mill that needs it, in order to destroy this destructive brood, &c., and prevent its future attraction to and lodgment in the mill—the fumes of sulphur, &c., producing a repulsive state of the atmosphere.

Broken wheat, meal, and flour absorb moisture from the atmosphere, when exposed to its action, more readily and rapidly than whole grain. Much of the floating stive and fine flour that adhere to things in the mill becomes paste from this source in muggy weather, or in dry weather in steam mills, where any portion of the waste steam from the boilers or from the cylinders is allowed egress into the grinding and flour departments, or into any place where the stive penetrates, more of the pasting being often from this source than from the steam emitted from the millstones in many mills, although the contrary is very commonly credited. The atmosphere of summer is more heavily loaded with vapour than the atmosphere of winter, and the atmosphere of tropical climates than the atmosphere of temperate ones—facts that require to be closely borne in mind in the investigation of the subject, and also in the practice of milling for export. When flour is collected together in a heap, or placed in flour-bins, or put into sacks, a thin layer of the flour on the outside is formed into a semi-clammy sort of paste, thus forming a protection to the interior; hence the reason why an old dusty miller's sack keeps the flour better than a new one, and why so many miller's sacks are lost! Hence, also, one of the reasons why flour sent to tropical climates require to be dry, *i. e.* made from kiln-dried wheat, and *kept* from the moisture of the atmosphere of such climates, which, over-night more especially, is excessively loaded with vapour.

To this moist theory, as it may not inaptly be termed, there is a dry one, in which the surface of the kernel becomes more dry than the centre; so that it is drained or dried from the centre by the equilibrium of capillary action, so to speak. So long as the air is more dry than the surface of the kernel, it continues to absorb moisture therefrom; and as the surface of the kernel becomes drier than the interior, the moisture in the interior is drawn to the surface by capillary attraction, and thus the simple drying process goes on until an equilibrium between the kernel and the atmosphere is obtained.

The breaking-up of the kernel into meal or flour facilitates the drying process—as it does the moistening one—by exposing a greater surface to the dry air, and reduces the distance from the centre of every individual particle of meal or flour to its surface. Hence the rapidity with which flour or meal dries when spread out in a thin layer to the action of a dry atmosphere in summer, or in frosty weather in winter, when comparatively no heat is present—more especially if the air is in motion, as a brisk frosty breeze. In a late harvest in the north, a dry rustling wind over-night dries the stooks faster than a bright sun, even when the thermometer does not indicate frost; and when the wheat has been carried and stacked, windy frosty weather will dry it faster and better than would a summer, or even tropical sun.

We have thus a hot drying process and a cold drying process that require illustration, in order to comprehend the difference between them as to why the latter dries faster than the former. Thus, when a sheaf is once wet to the heart, it swells and becomes tight in the band; and the first effect produced by the heat of the sun, or free heat in a close, stagnant atmosphere, is to make the band tighter; whereas cold produces the contrary effect in a rustling windy night. In the former case, the moist, warm air in the middle of the sheaf expands, thereby preventing its escape, even under a slight breeze; but in the latter, it contracts, and escapes, thereby making way for the free circulation of the air "through and through," to use a common rustic phrase in the harvest-field. The same takes place in the stackyard—heat from without adding fire to the combustion within. Hence the greater liability of stacks to heat in early warm harvests than in late cold ones. Frosty winds, on the contrary, carry off heat and moisture rapidly from the stack, thereby drying the corn and straw, leaving the whole so loose and open that you can easily thrust in your arm to the shoulder, whereas previously you could with difficulty force in your staff. Indeed, the difference is so great as almost to be incredible to those who have never been eye-witnesses to the quantity of moisture thus removed in a very short space of time.

A hot wind will dry sheaves very fast when it has a free circulation through the sheaves in harvest. Hay also makes more rapidly in a bright sun and breeze than in still, calm weather; and here we may farther observe that keeping the hay-tedding machine going in a calm day is tantamount to raising the wind. In all these cases the drying process is so manifest as to render a more detailed exposition of it unnecessary.

Under the hot grinding system, now generally practised, both these processes—the dry and the wet—are in operation. Thus, the current of air drawn or forced in between the stones and the heat produced from the other two sources, noticed in the previous article, rapidly removes the moisture, from the grain being ground in the form of vapour, this vapour carrying off a portion of the heat generated in a latent form, the remainder being carried off by the air in a rarified form, and by the flour and offal. In grinding with the quern, or ass-mills, without a millstone case, any little hot air and vapour thus produced escaped into the atmosphere as they issued out from between the stones. But when the stones are confined within the millstone-case, and the case put sufficiently close as to make the rough edge of the runner bring round the flour to the mill-eye shute, the heat of the hot air is aborbed by the flour, the vapour being thereby condensed; the heat given off is likewise much of it absorbed by the flour, as also the water: hence the heated moist flour, so much complained of under the old system described by Mortimer and other old authors of the last century; hence also the modern proposition of removing the hot air and steam from the millstone case, &c., by flour pumps, exhaust fans, stive rooms, and the like, so as to obviate the latter process of wetting and heating the flour. Before the flour issues from between the stones when grinding freely, it undergoes the drying process described above; but afterwards, when confined in the millstone-case for a time, it undergoes the moistening process; and if the atmosphere of the mill is greatly loaded with vapour, the flour may contain a greater percentage of water than the wheat before it was ground, the excess in the flour being obtained from the atmosphere.

(2). The second injurious effect produced by hot-grinding is the deperdition of odorous and sapid properties with other chemical changes of a kindred character that take place. In mill-phrase these changes are technically termed sometimes "killing the flour," at other times taking the "life" or "strength" out of the flour, and not unfrequently "dead flour." Almost every province of the kingdom has its own peculiar mode of expressing the one and the same effect produced. But in almost all these mill-phrases the *third* effect produced, viz., over-grinding, which is a mechanical effect, is included in this chemical one, which, we must here observe in passing, is a faulty and a very objectionable mode of reasoning or investigating the matter, more especially from a scientific point of view. Hence the reason why we have separated the chemical from the mechanical, in order that each may be examined in its own light practically as well as scientifically.

Many of the sapid properties of wheat have been separated and determined; but it is otherwise, as yet, with the odorous properties, so that in our present state of knowledge it would be premature to propose the discussion of either in detail. It is, however, well-known that some, if not the whole, of the odorous properties are very fugacious, and easily removed or destroyed in hot-grinding. Thus far the general chemical question at issue has been determined by experiment. It has also long been a settled question that when flour is thus deprived of its odorous and sapid properties, or the greater portion of them, it loses in a corresponding manner its nutritive value. Were those who grind medicinal plants, leaves, roots, and seeds to use mills of the construction used in grinding wheat, and to drive them at the same velocity, the drugs from such mills would be worthless for medicinal purposes. Why? Because their medicinal virtues which are due to these odorous and sapid properties would be either removed or destroyed in the grinding. The reason why the Arabs prefer flour ground by the rolling spindle-mill in preference to that ground by the hand-mill or quern is because the former is better flavoured and stronger, none of its odorous or sapid properties being removed or destroyed when thus ground. And one of the reasons why Scotch ploughmen prefer round oatmeal for brose and porridge is, that it is better flavoured, stronger, and heartier than when ground very fine. Grinding round coarse oatmeal a second time, which is sometimes done when it is imported into places where it is customary to grind it fine, always reduces its natural flavour and strength, making it insipid and more difficult to digest unless seasoned in the cooking by artificial means, or eaten with other articles that supply odorous and sapid properties. And it was for a similar reason that the grinding of wheaten flour a second time was prohibited in France some two hundred years ago, noticed in "Beckman's History of Inventions" quoted in a previous article. Now, in all these examples of second grinding and hot-grinding it is the heating in the grinding that carries off or destroys the odorous and and sapid properties, and not the fine grinding; for many drugs are ground as fine as the finest flour without suffering such deterioration of chemical principles and dietetic quality. Moreover, forcing in air between the stones so as to compress it greatly increases the heating process. This fact has long been known to philosophers; but the moment the compressed air issues out from between the stones into the millstone-case and has freedom to expand or rarify, it then absorbs heat rapidly, thereby removing it from the flour, when it is exhausted by a fan, as in the American, Dutch, French, and English stive-room contrivances.

(3). Overgrinding, or the destruction of the natural granulation of the flour; *alias*, the breaking up of much of the flour into floating flocculent stive and waste.

The different kinds of corn, when examined by a powerful microscope, present a considerable diversity of granulation; So does the starch from the gluten in any one kind of flour. Into the details of such diversities of granulation our limits will not permit us to enter. It would take a long paper to do this part of our subject justice. At present all that will be necessary to say is, that whatever may be the natural form of the particle of flour, it is destroyed by being broken up into shapeless flocculent fragments, so as to float in the mill along with heated air and steam. This excessively minute mechanical subdivision has a tendency to remove by mechanical means the volatile and more valuable elements, and by means of the heat always present to produce other changes of a chemical character, of which little is yet known. By such changes the nutritive value of the flour is greatly reduced, if not wholly destroyed, so far as the work of destruction extends. If finely vesicated in the cooking, it may pass through the stomach without doing much harm; but when made into pastry, biscuits, and the like, it is very liable to consolidate or run together, so as to prove impervious to the juices of weakly organs of digestion, and to this overgrinding of pastry flour more of the general prejudice to pastry is due than to fats and oleaginous and saccharine matters with which it is incorporated.

Running at the great velocity stones are now driven under the hot-grinding system, the grain is cut up into flour, and not ground into flour. Towards the periphery of a four-foot runner, making 120 revolutions per minute, the velocity would be about 1,400 feet per minute. One foot from the edge it would be 700 feet, and so on for other distances across the face of the runner. At such a rate, and running true upon its axis, the materials being cut up, being worked in spirally round the cutting process, requires little further explanation to show how grays and flocculent stive are produced, and how the very life of the flour is sacrificed in the manufacture of "*superfine whites*" for pastry-cooks. Amongst millers the process is generally termed "clipping," from the manner the "furrows" cross each other, and the "grays" are attributed to this clipping; but from the truthfulness with which stones are now hung and balanced, this popular notion, although a convenient mode of expression, is not the correct one, for the edges of the furrows of the stones do not touch each other. In point of fact there is an open space between the runner and the bedstone in the form of a wedge, the stones being about an inch asunder at the eye and nearly close at the periphery. A cannon ball cuts from its great velocity; and this involves the principle in which the sharp dress of the lands and edge of the furrows of the runner cuts the bran and offal into grays; but of this more in a subsequent paper.

Such are the three principal injurious effects produced under the hot-grinding system; and so long as the system is practised, sound economy in other parts of the mill must prove to millers the empty fabric of a vision, whatever hot-grinding patentees and their patrons may say to the contrary.

ENGINEER.

THE RINDERPEST—PRECAUTIONS AND REMEDIES.

By Mr. H. H. Dixon.

The following are Cattle Plague notes, which were made in the course of last summer's ramble among English herds. First, as regards precautions against the disease. As soon as this broke out in Sussex, Mr. Dumbrell, of Ditchling, who had upwards of a hundred Alderneys in milk, commenced washing them all over every morning with a weak solution of chloride of lime before they were put out to graze; the same disinfectant was kept standing in earthern vessels behind the stalls; the feeding troughs and the drains were also sluiced out with it daily; and every cow was tarred just above the nostrils. This herd was in a position of no ordinary danger, as three owners of adjacent land were losing beasts, and the infected farms were only separated from Mr. Dumbrell's by a hedge. A fourth herd was also suffering within a quarter of a mile. One of Mr. Dumbrell's shippons was bounded by the high road on one side and by a footpath on the other, but the cows were kept as private as possible, and no fat stock was brought on to the farm. These precautions were attended with complete success.

Major Gunter's Wetherby farm was in a deeply-infected parish, and cattle were dying or being slaughtered almost daily, close up to the park gates, for months. Chloride of lime was used liberally, but the Major's main reliance was on the very strictest observance of the isolation principle. The Duchesses and the rest of the cattle were divided into several lots of two each, and placed in small sheds all over the six-hundred-acre occupation; the yards attached to these sheds were netted round the bottom, so as to keep out dogs, hares, rabbits, and other "travellers." The herdsman and his assistants never went near any other cattle or person engaged about cattle on any pretence whatever; and if the Major had been out hunting, or anywhere else in the country, he never entered the sheds until he had changed his clothes. One valuable bull was slaughtered after a slight accident, rather than run the risk of bringing a veterinary surgeon to attend upon him; and when the butcher came for fat sheep they were driven out of the field for him while he waited with his dog on the road.

The Warlaby herd were in nearly as great peril, and had an equally happy escape. For six months the plague was within 1½ miles of them, and nearly 300 beasts went down either by disease or pole-axe. The last outbreak was within 400 yards of the farm buildings, and the fate of this great herd seemed to tremble in the balance. Vaccination and Macdougall's disinfectant were freely used, but Mr. Thomas Booth's main reliance was on burning tar in braziers at several points of the farm-yard. These fires were carefully looked to the last thing at night and the very first thing in the morning, and might have been smelt down wind for a couple of miles. So much for successful preventives—*quantum valeant*.

Secondly, as to remedies. In the case of Mr. Davies, of Mere Old Hall, near Knutsford, preventive measures failed, simply, as he believes, because, when the grass came, he placed his cattle in the field for a short time daily, out of the influence of chlorine gas. In this belief he is confirmed by the experience of his near neighbour Lord Egerton of Tatton, whose milch cows and feeding stock were subjected to the same treatment, but never allowed to leave the shippons. Hence, in spite of a severe attack of the plague on several farms in the vicinity of the Tatton Home Farm, they all escaped, while some of the West Highland bullocks in the park went down. Chlorine gas was quite the fashion in Cheshire, and as farmers were very "jealous" of contagion, every rural policeman carried, at the suggestion of Professor Stone, a wooden kit with him, as well as a waterproof bag, for disinfecting his dress. The kit had four compartments for bottles of muriatic acid, chlorate of potash, Stockholm tar, and "soap and sundries." The two former generate chlorine gas by contact, and a few drops of the tar poured upon some hot cinders will disinfect boots or clogs when suspended on a poker within reach of its vapour. The inspection dress is made of strong calico and fashioned like a diver's, and is fumigated and made ready for the next visit by putting it into the bag along with a perforated box in which chlorine gas has been generated and retained on pumice stone.

Mr. Davies' shippon is at the junction of three roads leading to Chester, Warrington, and Knutsford, and in the centre of a district through which the plague wended the same fatal way that it did in the last century—commencing near Warrington and coming along the low ground. In the small township of Tabley alone 662 beasts died; 41 were slaughtered, and only 20 per cent. were left. It skipped some farms and attacked others, and it would sometimes in its later stages take one cow and return to the same herd for another victim at the lapse of three weeks. Cleanliness was of no avail, and some of the very worst-kept shippons escaped. Mr. Davies's precautionary efforts were unintermitting from the first. Every beast about the place was vaccinated; hyposulphite of soda, beginning at 3 lbs. and so on to 5 lbs., was mixed for four or five months in 100 gallons of water; and chlorine gas was used night and day in the shippon. Sawdust was substituted for straw, in consequence of its absorbing the *fæces* better, and being so much more easily removed. The cattle were never more blooming than when they were turned out in the middle of May, for a few hours daily, into a field adjoining the shippon and abutting on the high road. There was no infected farm nearer than a mile, but at the end of three weeks an Alderney heifer was taken ill and died in 36 hours. She had no symptom of illness about her except a slight discharge from the vagina, and until the veterinary surgeon opened her, he thought she was ruptured. The bull by which she had been recently served was slaughtered immediately, but there was no arresting the evil, and in two days more nine or ten were down with it. Leonora, from Mr. Jolly's, was the first decided case, as they found her one morning with her back up, her coat staring, and her head and ears drooping; but Lady Best, from the late Mr. Langston's, Minstrel from Holker, Heiress from Mr. Hales's, Cherry Empress from Mr. Logan's, and Water Girl from the late Mr. Anthony Maynard's, soon followed suit. They sickened for three or four days, and on the fourth there was a strong discharge from the nose, eyes, and vagina. They could neither lie nor stand; their legs and heads were never still, and their moanings were sad to hear. They would become feverish, and then shiver like a man in the ague, and their *fæces* were quite lax and costive by turns.

As they were very valuable stock, and Cheshire was at its wit's-end in the hope of discovering some alleviation or remedy, the local committee consented to have them treated, but everything was useless except the iodine ointment, a compound of iodine, mercury, and lard, which was recommended by Mr. Lawson, veterinary surgeon of Manchester. His object was to set up a counter-irritation if possible, and the ointment rubbed twice or thrice a day on the chest gave apparent relief. When applied in the early stage it seemed their only chance, but unfortunately it was not thought of till some of the best had died. The climax was generally on the fourth day, and those which died often lingered on about three days more. One old cow of the Towneley blood fought on for upwards of a fortnight. When the turn for the better came, frequent doses of oatmeal-gruel were administered. Up to that point they could not be got to take anything, as their mouths were sore with inflammation, and they did not even notice water. Countess of Barrington and Surmise were never so ill as the others, but they wasted to skin and bone, and it took them and seven others (which had all been treated with iodine ointment) several weeks to recover their bloom. None of these nine survivors out of thirty-six were able to carry their calves, but slunk them, a perfect mass of putridity, after which they "came to hand" much quicker.

Mr. Aylmer, of West Dereham, grounded his treatment entirely on the administration of chloroform. When the plague broke out on this gentleman's farm last April, sixteen store bullocks were immediately slaughtered; and of his shorthorn herd, which numbered ninety head, five died before treatment, and six were not attacked; while forty-one recovered and thirty-eight died under chloroform treatment. On April 4th the disease showed itself by simultaneously attacking Easthorpe Rose in the home shippon, and then Easthorpe Lady in the fen (which is 1½ miles distant); and, on the 11th, Henrietta was taken ill at the White House Farm, within 300 yards of Mr. Aylmer's residence. The herd, which its owner always regrets having turned into the fields so early, was, like Mr. Davies's, of far too much value to be given up to the pole-axe without an effort, and hence, by the advice of Mr. Anthony Hamond, and with the ultimate sanction of the Privy Council and the assistance of Mr. Robert Overman, of Egmere, who had cured six by that agency already, Mr. Aylmer determined to try chloroform. "A friend in need is a friend indeed," and with very occasional absences, Mr. Overman worked day and night at West Dereham for nearly two months. They commenced on the 12th, when five had gone down, and a staff of seventeen or eighteen men were soon in regular hospital work.

The cattle were kept as warm as possible, and covered with sheets in their sheds—which were made still more snug by hanging curtains of sailcloth or sacking in front of them—and the disease was always allowed to develope itself in the mouth before the treatment began. They were also kept on as short commons as possible, and their mouths were examined the moment their appetites failed. Still there was no exact rule in the matter. Some were heavily smitten and full of mouth-symptoms when the appetite was good and the dew was on the nose. The fat cows were uniformly the worst cases; and the one ear down, the drooping eyelid, and the nervous twitch of the head, were among the sure and certain symptoms of seizure. Some became quite mad with pain, and broke their horns and tore out their teeth with convulsive rushes at the manger; whenever the air lodged in the tissues, and the skin was swollen up some inches from the flesh, nothing could bring them round.

It was found in practice that the chloroform acted best on an empty stomach, and that it could be applied too soon after the premonitory symptoms. A white steer, among others, which inhaled for seven days, and relapsed at the end of a fortnight, was certainly dealt with too soon. In fact, looking back upon the cases, both Mr. Aylmer and Mr. Overman believe that with their present experience they could have saved many more with half the quantity of chloroform. The bulls were as easy to chloroform as the cows, and they were one and all cast and bound, to prevent them breaking their horns. With some young bulls the chloroform acted too severely on the kidneys, and fatal inflammation of the bladder and urinary canal set in. After this, diuretics and alkaline solutions were used to neutralise the salts of the urine, and in two or three cases it had the desired effect.

Full-grown beasts had an ounce of chloroform administered to them each time, calves a quarter of an ounce, and others in proportion to their age. A saturated handkerchief was simply put in a bag, which was hung close under the nostrils, and tied by a string behind the poll. Five to seven minutes was generally sufficient to produce insensibility, and the cattle were kept under the influence for periods of from half-an-hour to two hours. Seven or eight doses upon the average were generally found sufficient to effect a cure. Rosa Lee had seventy-four inhalations between April 19th and June 18th, and five others had from forty-eight to sixty. General Hopewell, which was hired from Mr. Thomas Booth at 200 gs. for the season, was a very anxious and curious case, as his general external symptoms were healthy, but his mouth very bad. He was only ill three days, and had six inhalations, but his cure became hopeless, and he was killed on the fourth. Master Jolly fought hard for a month, but fifty-two inhalations only kept the disease under, and failed to cure him.

The leading effect of the chloroform was to convert the breath of the cattle from a very foul into a perfectly pure state. Before the administration the stench from their fevered mouths was fearful, and in a few minutes the breath became "as sweet as a nut." The inflammation of the mouth also seemed very much subdued, and the blood-shot fiery eye, under its influence, gradually grew quite natural again. It appears to neutralise the poison in the system, while the suspended vitality gives the constitution rest, and enables it to "spar for time." The fever usually returned in not less than twelve hours, and if it kept away for more than forty-eight they were generally safe, and ready for linseed tea, oatmeal-gruel, and other stimulants. Still the disease was most treacherous. They would rise up, eat hay, and drink water after chloroform as if nothing had happened, and then, when everything seemed to be going on well, they would relapse and become as ill as ever. However, after all this care and anxiety, Mr. Aylmer found himself, before July, with a clean bill of health, and with upwards of 50 per cent. of those which had been treated, alive and well in their stalls. All of those which were in calf went their full time, and the calves showed no traces of the crisis through which the dams had passed. The treatment was originally suggested by Dr. Dickson, author of "The Fallacies of the Faculty." Such are the principal facts as to precautions and remedies which I gathered in the course of my tour.—(*From the new number of the Royal Agricultural Society's Journal*).

ON THE CATTLE PLAGUE.

Sir,—Surely the time has arrived when the only precautionary measures that can be adopted, whereby the safety and security of the cattle and sheep of England can be ensured, should be carried into effect, namely, the slaughtering of all foreign cattle and sheep at the port of debarcation, which would not lessen the supply of meat to this country; that public slaughterhouses should be provided at the public expense; that certain sea-ports only should be licensed by the Privy Council for the landing of foreign cattle, which should be slaughtered on landing, and forwarded as dead meat only into the country.

By the importation of foreign cattle England has sustained an immense loss by the rinderpest, or cattle plague. I believe nearly 60,000 head of healthy English cattle have been slaughtered for the stamping out this fearful malady, thus entailing a loss of about one million sterling, and that those lost by the disease may be fairly put at from three to four millions sterling; say, total loss from four to five millions. I ask, can we afford a repetition of such a loss by still allowing the free import of foreign cattle and sheep alive into this country, and to be forwarded to our great Metropolitan market, and from thence to spread into our London dairies as this frightful scourge has recently done? I answer, certainly not; but that we should, by the adoption of such restrictive measures as slaughtering foreign animals on arrival at the port of landing, secure to our people an abundant supply of animal food, and yet secure our own producers from the losses entailed by this frightful disease.

We have now, I regret to say, a fresh outbreak in some of our London dairies. Can this be attributed to any other source than the import of foreign cattle into our London market? We are also informed the disease has broken out in several fresh centres on the Continent; and let me ask, is not our danger increased in the same ratio? and is it fair to us, the British farmers, after the immense sacrifice we have lately made in attempting to stamp out this fearful calamity, thus to continue to endanger us by subjecting us to a repetition of this scourge, when so simple a plan as the slaughtering animals on their arrival in this country can so easily be adopted!

Take the port of London as the most important. Surely a site on the banks of the Thames, on the Essex side of the river, could be procured by Government, on which slaughter-houses could be erected. I name the Essex side of the river, as it would give every facility for the conveyance of the dead meat, thus slaughtered, by the various lines of railway running from the Essex coast to nearly all our great hives of industry by the Great Eastern, Great Northern, Midland, &c. Then why not adopt a plan that would not lessen the supply of animal food one ounce, yet at the same time give security and safety, not only to the owners of our own herds and flocks, but to the meat-consuming population of England?

Last winter, in consequence of this disease, I should not have had the courage to have bought any beasts for stall feeding; but in consequence of Ireland being free from this disease I sent two of my sons over, and they bought largely, sufficient for all our farms; and, thank God, we escaped the disease, and did not lose a bullock.

In January, 1865, by letters in the *Standard* and the *Mark Lane Express*, I urged the necessity of adopting the plan of slaughtering all foreign cattle on arrival. Had this plan been adopted, something like four millions sterling might have been saved. Let this plan be now carried out, and I have no fear as to the future. SAMUEL JONAS.

Chrishall Grange, *May* 17.

THE MALT-TAX.—THE COMMITTEE OF INQUIRY.

One of the most famous exploits of the gallant Baron Munchausen was, as we learn from history, the raising of the Royal George. By the aid of a monster balloon and a couple of stout cables he brought the good ship not merely to the surface, but saw her, somewhat to his surprise, gradually ascending into the air at the tail of the well-inflated canopy. There seemed, indeed, to be as great a risk of going as far wrong one way as the other, when the Baron pointed a twelve-pounder at the receding prize, and deftly knocking all the gas out of the silken globe, the ill-fated vessel fell and settled again in the precise spot from which she had just been moved. The House of Commons Committee, as granted on Tuesday, May 14, would promise to do about as much for the Malt Tax. Repeal will float high in blue ether at the tail of corroborative evidence and the closely-put clauses of a Report, until the Chancellor of the Exchequer, alarmed at the power he has created, shall point the twelve-pounder of his exigencies at the side of the soaring monster, and straightway knocking all the wind out of its sails, the burden with which it was charged will fall and settle very much where this was before.

Seriously, after the prize essays, the long speeches, the oft-told tales on deputations, and even the previous inquiries, is any further inquiry into the operation of theMalt-tax really necessary? There is scarcely topic upon which either its friends or its foes in or out of the House are so well up as in this matter of the repeal of the malt duties. From Mr. Disraeli to Mr. Bright, from the country gentleman to the teetotaller, every phase of the argument is sufficiently familiar. "Financial reformers, the advocates of direct taxation, and political economists go to dinner," as Mr. Corrance said, when the question is under consideration; while the very champions of the cause have in their enthusiasm already gone almost too far, "for after the able speech of the honourable member for Norfolk, it would be impossible for a select committee to throw any more light on the subject." This compliment is the greater, as it is offered by a member, Lord E. Cavendish, who sits on the other side of the House; and, no doubt, the responsibility—the conduct, as it were, of this case—centres very much on Mr. Sewell Read. It is satisfactory, moreover, to feel that the experiment of sending a *bonâ-fide* tenant-farmer to Parliament has, in the instance of this gentleman, been a decided success. No man's opinion on things within his own peculiar province has been more readily respected; no one has ever felt his way more surely, or gathered more weight as he has gone. Mr. Gladstone himself paused the other evening to testify to the merit and ability of "the honourable gentleman who has just spoken, and who speaks with a modesty equal to his authority and experience." Mr. Read, to be sure, went into the House with the especial object of repealing the Malt-tax, so that he is here on his own ground; although day by day he must only the more thoroughly realize the difficulties of his position. Any such embarrassment is, no doubt, materially increased by the fact of his own Party being in office. Were the two sides differently disposed, Mr. Sewell Read's course would be clear enough—he might at once lead on the attack; whereas he must now of a necessity parley and temporize, for his own fellow-soldiers would not follow him into action. Manifestly the Farmer M.P. is to some extent the victim of circumstances, and hence discretion becomes a virtue that would scarcely be cultivated at other times.

Still, something must be done to keep the fast ebbing flame alive, and that something resolves itself into a Committee of Inquiry. Of inquiry whither, or into what? More than enough has already been said and done as to the value of Malt as food for stock, and little more could come of pushing this point any further. The chief features of the question, as we take it, to be still developed, will be the extent to which the operation of the Malt-duty interferes with the proper or unfettered cultivation of the land, and its effects upon the health and strength of the labouring-classes. The first of these ramifications opens a wide field for "proof," and the other is very closely associated with the means of relief which it is proposed to go for. So far the argument has been that the working-man should have increased facilities for obtaining wholesome nourishing drink. He should be encouraged to brew for himself, or to buy his beer, as he might his bread, over the counter of any one who chose to sell it him. More than sixteen years since, the Farmers' Club passed a resolution to this effect, viz., "That the labourer should have every opportunity given him for brewing the beer he requires, or for procuring it on fairer and cheaper terms; and that the retention of the Malt-tax is to him, as a consumer of that his labour produces, both a serious oppression and a direct injustice." Supposing however, as indeed proposed, that we shift the duty off malt to a licence on beer, will not the injustice, so far as the labourer be concerned in brewing or buying, be a still more direct tax or injustice? There is something, moreover, scarcely in accordance with an Englishman's house and his castle, in this notion of the exciseman peering into every cottage where he may find a jug of home-brewed. Mr. Sewell Read says the licence would be cheerfully paid, although we honestly confess that we much doubt if the result would be to increase the supply from house to house, as put against the present beer-shop system. Mr. Read says, further, there would be no more difficulty in imposing this licence than there was in collecting the income-tax; but the illustration is by no means a happy one. Of late years there has been nothing more objectionable in its principle than the income-tax, mainly from its somewhat impertinent curiosity into a man's own private business; and the beer-licence would work much in the same way. It would be hard to keep the tax-gatherer's head out of your doorway; and it is of this interference that the poorer classes are especially, and we had almost said very properly, jalous. Somehow or other, it does not sound quite right, that you shall encourage a man to go in a certain direction by putting the collector on to him immediately that he proceeds to do so. With a practical farmer like Mr. Read himself to call the evidence of other practical farmers, we have little doubt but that the agricultural section of the inquiry will be worked up as well as it possibly can be. But the repealers must go as much or yet more for the sympathies of the working classes, who, as the *Saturday Review*, in an article on Tuesday's debate, says, and says well, "would profit most largely and immediately by the boon, but have never joined heartily in the agricultural agitation; and, until they begin to demand relief, Parliament will not be anxious to make heavy sacrifices for their benefit. Former Excise duties have been repealed almost exclusively on the demand of the consumer. The producer attracts only languid attention when he complains of the artificial restriction of the market." Would a beer licence bring the consumer over, or would not its meddlesome action be as intolerable as the tax to which habit has in some degree reconciled the people?

THE HOUSE OF COMMONS.

MAY 14.

THE MALT-TAX.

Colonel BARTTELOT, in moving for a Select Committee to inquire into the operation of the malt-tax, observed that whenever the question of repealing the tax had come before the House as an abstract question, large majorities had refused to accede to the request of the farmers; accordingly, those especially interested to secure the repeal thought their object would be attained if the House were fully informed upon the subject, and they held a meeting in the Tea-room of the House upon the subject. The hon. member for East Norfolk was there, and when he found that the unanimous opinion of the meeting was in favour of moving for a Select Committee, he readily assented to withdraw a motion on the subject which he had upon the paper, and promised his earnest support to the motion for a Select Committee. Although the hon. member's course in this respect was most consistent and praiseworthy, he had been much and unjustly censured by the Central Association for the repeal of the tax, whose managers should know that to blame their friends because they exercised their discretion was not the way to carry their agitation to a successful conclusion (Hear, hear). In the year 1846 a committee of the House of Lords inquired into the state of the burdens upon land, and in the opening of their report they say:—"The tenant-farmers lay great stress on the malt duty, and its injurious interference with the cultivation of barley. The committee cannot, however, consider that impost, which, on the average of the last ten years, has produced very nearly £5,000,000 annually, as borne exclusively by the land; beer being almost a necessity of life with the mass of the population, the duty falls as a general tax on the consumers of the article; but it is unquestionable that so heavy a duty diminishes the demand and deprives of a ready market all except the best qualities of barley. A duty of 21s. 8d. on a quarter of barley costing 34s. is so heavy a tax that Mr. Barclay is of opinion that no brewer can afford to buy inferior barley and make it into malt. The agricultural witnesses examined before the Committee complain loudly of the restriction the Excise laws impose on malting inferior barleys for fattening purposes. The advantages of this process having been matter of dispute between learned chemists and practical farmers, the Committee will content themselves by referring to the evidence of Mr. Hudson, of Castle-acre, Mr. Bennet, &c., on this subject, and adding that if further experiments should establish the utility of the process, the malt duty must be considered as a serious obstruction to agricultural economy." Another committee on the subject sat in 1863. The right hon. gentleman the member for South Lancashire was a member of that committee. It sat so late that it made no general report, but it was agreed instead that it should sit and report in the following session. These facts, he thought, would justify the proposition which he now made for the appointment of a Select Committee. Two points well deserved inquiry before such a tribunal—first, whether the present system did not hinder the proper rotation of crops, and thereby retard the improvement of agriculture; and secondly, whether malt was not good as food for cattle. The right hon. gentleman the member for South Lancashire, seeing that there was something in the complaint made, particularly with regard to the poorer kinds of barley, sought to introduce a system under which barley of a lighter character and inferior quality might stand some chance of being bought. But this attempt had been a failure; the maltsters would not purchase anything but the best qualities of barley, and therefore the inferior qualities were a drug in the market. Men who ought, in proper rotation, to grow barley, did not do so, but grew wheat or oats instead, being certain of obtaining by that means a productive crop, the demand, on the contrary, which would be created for a crop of barley depending entirely upon its quality. The right hon. gentleman had also introduced a Bill with the object of enabling malt to be used for feeding purposes. But the only result of that Act was that his hon. friend the member for Derby brewed from barley some beer which the right hon. gentleman opposite tasted and thought very good. (Mr. Gladstone made a gesture of dissent). The right hon. gentleman perhaps had forgotten the circumstance, but he remembered quite well his going out and trying the two samples, and coming back with a smiling countenance, and thinking his own mixture the best (much laughter). Into the figures, as they affected the consumer, he would not enter; but it certainly well deserved inquiry whether the statement made by Sir F. Kelly was capable of being substantiated—namely, that to collect £6,000,000 of revenue it cost the consumer £20,000,000 of money (Hear). There was another consequence of this tax severely felt in country places. It placed before poor men by the hands of the publicans an inferior drugged article (cheers), and though persons in a position to do so might obtain a sound article from the brewers, the beer which was supplied in the common public-houses was most injurious in its effects upon the working classes. The annual report in the *Inland Revenue Almanac* gave the following facts:—"Twenty-six samples of beer, and of materials found in the possession of licensed brewers, have been analyzed, and of these twenty were found to be illicit; the prohibited ingredients being, in 14 samples, grains of paradise, one of these samples containing, in addition, tobacco; in two others, cocculus indicus was present in large and dangerous quantities; two samples contained capsicum; and the remaining two proto-sulphate of iron. Generally, the prohibited materials employed in the adulteration of beer are not injurious to health, and it is but seldom that instances come under my notice in which poisonous substances have been used, the object of the fraudulent brewers or retailers of beer being more to increase the bulk of their goods than to render the beer stupefying by the addition of noxious materials. Still there can be little doubt that the practice of adulterating beer with poisonous matters, such as tobacco and cocculus indicus, is more prevalent than might be inferred from the small number of detections made." That report showed at least that adulteration was going on. No doubt the Chancellor of the Exchequer and the right hon. gentleman the member for South Lancashire might see difficulties in the way of taking the tax off malt and placing it on beer; but still, if the change were for the public benefit, if it were opposed to free trade principles that barley should be hampered with heavy taxes, it was the duty of the House, and one from which it ought not to shrink, to deal with this tax, especially as by judicious action the revenue would not be diminished. His right hon. friend (the Chancellor of the Exchequer) had once endeavoured to take off half the duty upon malt; no great encouragement was given to that proposal, but his right hon. friend, he believed, had faithfully endeavoured to carry out his own convictions, though in the face of great difficulties. He himself had not hesitated to declare that the malt-tax could not be dealt with this session, the surplus not being sufficiently large. The right hon. gentleman the member for South Lancashire, the right hon. gentleman the member for Ashton-under-Lyne, and all great authorities had stated that it was of no use attempting to deal with the malt-tax except in a very large way. He asked for a committee, believing he should be able to convince the House that great injustice was done to the growers of barley, and that the abolition or partial abolition of the tax would greatly benefit the consumer (cheers). The hon. and gallant member concluded by a formal motion for the appointment of a Select Committee.

Mr. C. SEWELL READ rose, with great pleasure, to second the motion of his hon. and gallant friend. The notice which he had placed upon the paper at the early part of the session might have taken the form of an abstract resolution, somewhat similar to that moved in the previous year by the present Lord Chief Baron, the loss of whose services in that House, particularly in relation to the present question, they must all deplore (Hear). Upon further consideration, he thought the best way to come to a satisfactory and just settlement of this question was that just submitted to the House by his hon. and gallant friend—a course of proceeding which was by no means to be considered as shelving the question, as some persons supposed, but was likely to lead to a just and satisfactory settlement (Hear, hear). There was an opinion prevalent out-of-doors that they had had several committees upon this malt tax. But the only inquiry he could find was that which took place in 1835, when the Commissioners, who were appointed to inquire into the Excise revenue generally, reported upon bricks, glass, paper, soap, and, lastly, malt. The report was remarkable by its statement to the effect that, if it was possible to increase the supply of barley by admitting free importations, it would be perfectly safe for the Government to abolish half the duty upon malt, because the revenue would probably be very soon recouped by the increased consumption of the article (Hear, hear). The first inquiry which the Committee would enter into was that regarding the case of the producer. Now they had learned many valuable lessons from free trade. In the case of meat, they need not be seriously alarmed on that head, because, though it cost no more to send a bullock from Holland or Hamburgh than from the eastern parts of England, the prosperity of the working classes had increased since free importations were allowed, and larger sums of money were received in consequence of the increased consumption of meat. Again, there was wool. It was formerly thought that the Southdown varieties were the best adapted for the English market: nevertheless, we found that other countries could not grow Longwools in such perfection as we could. Then as to wheat, also, other countries could produce the article cheaper and better than we could. But in respect to barley it was impossible for the foreigner to touch us, because the soil and climate of this country were peculiarly adapted to its growth (Hear, hear). We sent to Australia, in return for some wheat received from that distant country, a considerable amount of barley, the exportations of which, since 1862, had increased rapidly. He would ask whether the House thought that an excise duty of 6d. on meat would benefit the consumer? or whether a tax of 1s. on woollen yarn would prove of advantage to the manufacturer? or whether an excise duty of 20s. upon flour would be found serviceable to the grower of wheat? (Hear, hear.) He apprehended that under no circumstances could such a tax be of any benefit to even the best descriptions of wheat; whereas, on the other hand, it would naturally interfere with the rate of the ordinary descriptions which we grow. He contended that the malt tax was a similar restriction. With regard to some lands, it paid best to keep them in grass; and although they employed less capital and labour, yet they produced rather more profit; and it was an ascertained fact that one acre of corn produced more human food than ten acres of grass. The right hon. gentleman the member for South Lancashire told them on a former occasion they ought to be well contented with the improved value of their barley crops. Now if the price of barley was allowed to find its natural level, it would eventually exceed the price of wheat. Under the old protective laws, wheat was forced into cultivation, and also forced up in price; and, from 1800 to 1840, two bushels of barley were about equal to one bushel of wheat. He could assure the House, however, that the farmers of this country wanted all the improved prices which could be obtained, and they also wanted all the fair play and all the relief they could get (Hear, hear), to compete with the foreigner, who had cheap labour, cheap land, and very light taxation (Hear, hear). The importation of cereals, which in 1836 was under one million, had averaged during the last five years fifteen millions; and the farmer, although he might have gained something by free trade, lost that entirely, if he grew only ten or fifteen acres of wheat. Mr. Caird, who was a high authority on agricultural matters, had informed the House that a barley farmer could not be a bad farmer. He (Mr. Read) endorsed that opinion, because, in the culture of light lands, barley was preceded by the growth of some root crop, which was eaten off by sheep, and which increased the growth both of mutton and wool; but grazing alone did not pay. The high value of meat was not of that benefit to the farmer which was supposed, especially when they considered the enhanced value of feeding-stuff, and also the enhanced value of manure, labour, and rent. Winter-grazing did not generally answer; and every bullock that he grazed was a loss of 40s., every sheep 5s., and he also lost 1d. per lb. on all his pork. He looked, in fact, for increased corn crops, rather than expected direct profits from winter grazing. He was then speaking of grazing stock on arable land; but where stock could be reared or grazed on other land, there was ample profit. He contended that every extra bushel of corn and every extra pound of meat produced, not by protection, but by freedom from fiscal restrictions, must be a great benefit, not only to the farmers, but to the whole of the community. He was unable to prove that assertion by statistics; but a few years ago the Poor-law Board attempted to collect some agricultural statistics. Those collected in Norfolk, he believed, were the most reliable; and he found from them that in Norfolk, in 1854, there were 203,000 acres under wheat, whilst last year there were only 189,000 acres. In 1854 there were 161,000 acres tilled with turnips, and only 134,000 acres last year; whilst the extent of the permanent pasture-land increased from 193,000 acres in 1854 to 209,000 acres last year. In 1854 there were in Norfolk nearly 100,000 head of cattle; but last year it was 90,000; and, as at least 5,000 died last year of the cattle plague, it was only fair to take it at 97,000. The most remarkable decrease was in sheep; for whereas there were 841,000 sheep in Norfolk in 1854, there were only 596,000 last year. He also believed that the statistics of Ireland would show that, where corn was the least grown, there they also produced the least meat. He contended that the malt tax fostered bad farming. Suppose light arable land would grow four quarters per acre of barley, and if they expended 30s. in artificial manure and feeding stuffs, the produce might be increased by twelve bushels, which would be sold for 50s. The duty on that would be 32s.; so that the House would see that the price of manure and the duty exceeded the value of the barley by about 12s., and that amount was lost by the farmer or the consumer. That would be the case in the event of fine weather and a favourable harvest. But suppose the weather was ungenial, and the harvest bad—in that case the produce would, in all probability, be reduced 5s. or 6s. per quarter in value, in which case the advantage would be in favour of the bad farmer. The committee should also be empowered to inquire the reason why the good intentions of the right honourable gentleman the member for South Lancashire had so signally failed. The malt, by weight, last year was only 50½ million bushels, and out of that large quantity 3½ millions of bushels only were charged by weight. He believed that the bill was originally passed for the benefit of the growers of barley on heavy lands which was generally weighty, although coarse in grain; and therefore the barley that was principally malted under this Act was the light, bright, foreign barley, and not the English barley which it was intended to benefit. In 1865 we had a hot summer, and a large quantity of barley in Norfolk ripened prematurely. It was very thin, and the maltsters malted a great deal under the provisions of the Act. Last year, however, we had a wet harvest: a great deal of the barley had to be kilndried before it could be malted, and it consequently was very much reduced in weight. Maltsters preferred having the duty by weight rather than the old plan. Then, as to the Malt for Cattle Bill. In 1865 there were 60,000 bushels of malt made under that bill, and in 1866 only 29,000 bushels. The operations under that Act had almost ceased, owing to the restrictions and the interference of the Excise. There were, however, a sufficient number of experiments made to prove what practical farmers and agricultural chemists had long ago determined, that malt was a most useful condiment for the feeding of cattle, and particularly so for the rearing of sick young stock (Hear, hear). Notwithstanding the attack that had been made upon him in the leading evening paper relative to what he said on a former occasion, that in the rural districts children should not be kept at school until they were between thirteen and fourteen years of age, before they knew something of agricultural labour, and the assertion that the farmers of England would like to feed the agricultural labourer upon bread and cabbage, he should wish, if they did so, they should be able to wash it down with a little beer (Hear, hear). He did not believe in the evangelizing influence of beer. He did not think it was possible to extract more harm and less good than they did at present from the use of beer in this country. It was the national beverage, sent by a kind Providence to strengthen the labouring man and refresh him when he was weary. The argument was that some artizans already took too much beer, but some agricultural labourers had none. He doubted if an agricultural labourer had been seen drunk in his cottage, but it was a frequent occurrence to find him in the public-house in a state of beer (Hear, hear, and laughter). A tippler, in answer to the question whether he wished the beer to be made more pure, replied, "It is black and thick, and it makes me drunk. What do I want more?" (Hear, hear, and laughter). They could not improve the habits and tastes of those men; but if there was a moderate supply of good beer for the labourer to drink with his meals, when he was hard at work, it would be of incalculable advantage to him; and if the malt was free from duty, a large quantity would be brewed by cottagers (Hear, hear). They found wines were cheap in foreign countries; but they had been informed by Archbishop Manning that, in the course of a twelve years' residence abroad, he only saw during that time two drunken men and not one drunken woman. The arguments against the repeal of the malt-duty were numerous and various. In the first place, they were told that the country would be inundated with foreign barley; but, so far from that, it was well known that this country now took all that was sent to it; and so far from their having been inundated with foreign malt, there had only been imported 48 bushels, which paid a duty of £7, whilst there had been a drawback on malt of £65,000, and on beer of £203,000. The foreigner had not the restrictions of the excise to deal with; and it would be a great advantage to the maltsters of this country if they could malt in bond, which he might be able to keep without having immediately to pay the duty. The return for sugar in 1865, used in brewing, was 2,760 tons; and last year it was 7,272 tons; and in the first six weeks of this year it had reached 2,853 tons, which was greater than they consumed in the whole year in 1865. As the excise only took the brewers' returns, there was no ascertaining exactly how much was used; whereas, in the case of malt, every care was taken to ascertain the exact quantity used. There must be something in this adulteration of beer, because the brewers appeared to have been able to produce lately a larger quantity of beer from a similar quantity of malt. In 1862, there were 17,000,000 barrels of beer made from 41,000,000 bushels of malt; in 1866, there were 22,000,000 barrels of beer made from 45,000,000 bushels of malt. The prosperity of the labouring community had greatly increased the consumption of beer; and that consumption, he thought, might be further increased by the repeal of the tax, and the price of barley at the same time enhanced. The burdens on land were annually increasing. They had this year lost the privilege of keeping sheep-dogs free from tax; and the exemption of duty on fire insurance will not much longer exist. The succession duties had also been imposed on land; and therefore he contended that the only real and practical argument against the repeal of the malt-tax was, that the Chancellor of the Exchequer could not spare the money. The right hon. gentleman might, however, have given them this year as much relief as he could have spared, whereas the whole tax might be recouped by the extension of the brewers' licence, with general application, even to private brewing. Last year, the brewers' licence of 3d. per barrel produced £343,000, and an increase to 3s. would produce over £4,000,000. The licence, if applied to private brewings, would be cheerfully paid; and there would be no more difficulty in imposing it than there was in collecting the income-tax, by calling upon a man to make his own returns. If the committee were appointed, he felt certain their labours would prove the unfairness of the malt-tax, and that the farming interest had not unjustly complained of the manner in which it was imposed.

Mr. GLADSTONE: I have been given to understand it is the intention of her Majesty's Government to offer no opposition to the motion, and I don't at all complain of that intention. The general principle of inquiry into the operation of the malt-duty is one which it is impossible to take a fair objection to, for the first processes of the manufacture raise a number of questions with regard to the incidence of the tax which ought fairly to incline the House to grant an inquiry into its operation upon a smaller showing of a positive grievance than it would require in other instances. Reference has been made to two Acts which I proposed, one having reference to the use of malt for the feeding of cattle, and the other to the charging of duty by weight. I beg pardon for having interrupted the hon. member who has just sat down; but I thought he misstated the per-centage of malt the duty on which had been charged by weight; as it is three million and a-half bushels out of 50½ million bushels, it would be about 7 per cent. Of course, it is desirable that the House should know more exactly than it does what the operation of that Act has been. As far as the quantity is concerned, I should say it is larger. At the time the Act was passed I don't think the expectation was that it would apply to a larger proportion than 7 per cent. of the total consumption. It is important the House should know how far the hon. member has foundation for saying that the barleys which have had the benefit of the Act are to a considerable extent foreign barleys. I don't mean to say that that would be an objection to the Act, but it would be a fact of very considerable interest. It is desirable we should have that sort of information a committee would gain with regard to the application of the Act relating to malt for feeding of cattle. There has been no recent return on the subject, but if my memory serves me, the introduction of the Act led to a considerable number of malting establishments to prepare malt for the feeding of cattle. However, the business gradually dwindled, and I don't know whether there was a partial revival of it during the cattle plague, but it would be desirable to know the facts. It was stated in some quarters, and it is desirable that the allegation should be tested by inquiry, that the establishments were closed by the restrictions of the Board of Inland Revenue, which were so stringent that it was impossible to carry on business. I know that the opinion of that Board and of its officers was very different, and it would be only fair to all the parties that evidence should be taken on the subject, because, unquestionably, if the application of malt upon a large scale to the feeding of animals is economically desirable and advantageous, such application would be a material point for the consideration of the House in connexion with the malt-duty (Hear). The hon. gentleman who has just spoken, and who speaks with a modesty equal to his authority and experience, referred to the repeal of the corn laws as having raised relatively the prices of wheat. It has been a custom with those who have endeavoured to moderate the statements of the opponents of the malt-tax, to point out the progressive increase in the prices of barley since the time the corn laws were repealed. The hon. member accounts for this in a degree perhaps by saying that the effect of the corn laws evidently was to produce a more depressive action upon the prices of wheat than upon those of other grain. There may be some truth in that, from causes which it is not necessary now to examine; but I do not think it is by any means an adequate or sufficient explanation of the growth in the prices of barley, such as we have witnessed. If it were true the prices of wheat had been raised relatively to the prices of barley by the operation of the corn-laws, and if that was the whole explanation of the great change which has now taken place in the prices of barley, my argument would be that in that case the effect would have followed at once and with great rapidity upon the abolition of the corn laws. That, I think, was not the case; there was not a sudden and violent change in the relative prices of wheat and barley upon the abolition of the corn laws; but, slowly, gradually, and regularly, the price of barley has gained upon the price of wheat, I think also, in extenuation of the charges against the malt-tax, it is only fair to point to the fact to which the hon. member referred with satisfaction, that in this article we are not an importing, but an exporting country, to a limited extent in malt, and to a large extent in beer. Here, again, is a fact which in some degree mitigates the statement made with regard to the effect of the malt-tax upon the badness of beer in our country public-houses. If the malt-tax necessitates brewing of very bad beer relatively to its price in our country public-houses, how in the world is it that we are able to brew beer so good in this country that we can afford to export it to other countries and beat the brewers of beer there out of their own markets? The hon. gentleman who seconded the motion said of the six weeks' credit to the maltster that he did not consider it a matter of consequence; but the credit is more than six weeks. It is upon the average nine weeks; but even if it were six weeks, the hon. member, or any one else who obtained the money from his bankers, would find he would have to pay for it. I hope the effect of this debate will not be to raise a sanguine expectation out of doors with regard to the power of the present or any other Government to part with the malt-tax, in the shape, I mean, of a large revenue from barley converted into beer. I have never been able to understand why it is so little attention is paid by the advocates of the repeal of the malt-tax to the operation of the spirit-duty upon the price of barley, which is quite as fair a subject for inquiry. It must be borne in mind that the duty upon malt is a growing duty. A few years ago it was £5,000,000, now it is spoken of as £6,000,000, and if I am not mistaken, it is turned or approaching £7,000,000 a-year. I was a little sorry to hear the reduction of the number of maltsters and brewers referred to apparently with a disposition to suggest that the reduction was to be regarded as an evil; but it would not be fair to ascribe that reduction to the malt-tax. This is a manufacture of a highly scientific character, requiring not only a rough and ready experience, but also a considerable knowledge of a refined character, especially connected with practical chymistry; and in this manufacture there is a natural and necessary tendency to concentration in fewer hands, and it is in connexion with this concentration and the establishment of large concerns there has been that improvement in the quality of the article produced which has given us the access we now have to foreign markets. Therefore I think it would be a mistake to suppose that the burden of the malt-tax was the reason for the reduction in the number of maltsters and brewers. I remember very well that before the repeal of the paper duty the number of paper makers in this country had been diminishing, and at the time of the repeal it was supposed they would continue to diminish; but the very first effect of the repeal was to stop the diminution. And the number of maltsters and brewers depends upon causes quite distinct from the incidence of a duty like the malt-tax. I have only referred to a few of the points of this question, which appear to show the very legitimate reason which exist for instituting an inquiry of this kind, particularly because hon. gentlemen have been disposed fairly to admit that the interests of the revenue must be considered. Surely it is one of the meanest arts of the demagogue, using that word in its worst sense, to hold out to any portion of the community interested as producers vague expectations that the State will be able to part with enormous sums of public money, we having in our own minds at the time no means of replacing those sums, and consequently being guilty of arousing expectations which there is no possibility of fulfilling (Hear). The hon. and gallant gentleman (Colonel Barttelot) says that he wishes this committee to take the place of the committee which was appointed on the motion of the present Lord Chief Baron, Sir Fitzroy Kelly. I submit to the hon. and gallant gentleman whether he would not do well to adopt the terms in which that committee was appointed. In so doing he would not in any degree alter the breadth and fulness of his inquiry, but might help to prevent the growth of those vague expectations which I am sure he would not wish to encourage. The terms were these, and they were not moved by me as an amendment on the motion, but were adopted by Sir Fitzroy Kelly, and made a part of his motion. The Select Committee was appointed on the 23rd of June, 1863, "to consider whether, compatibly with the interests of the revenue, the laws relating to the Excise duty on malt may not be amended so as to operate more advantageously with reference to the cultivation and price of barley, the manufacture and the price of malt and malt liquor, and the use of malt in the feeding of cattle and sheep." This plan of pointing out topics of a practical character for consideration by the committee would be an improvement upon the terms of the present motion, which is necessarily somewhat vague and general in its character. I do not wish to make this suggestion in any hostile sense, nor should I think of moving an amendment, but I would submit to the Government and to the hon. and gallant member whether it might not be of some advantage to enlarge the terms of the motion as I have suggested. I must add that it would be only fair and just if the hon. and gallant gentleman also thought fit to include in his motion the sister topic to which I have referred, namely, the operation of the spirit duty upon the same subject. Questions relating to the growth of barley used in malt chiefly interest the eastern and southern portions of this country; questions relating to the growth of barley used in the making of spirits have a much wider range, and extend to the furthest north. I should be disposed to consider that it would be a further improvement in his inquiry if he were to make it cover the whole growth of barley considered as an article of production which is to undergo manufacture (Hear, hear).

Mr. MAJOR-HENNIKER, as the representative of a barley-growing county, supported the motion of the hon. and gallant gentleman, believing that the committee would lead to a thorough investigation of the whole subject. It would show also that the repeal of the malt-tax would be nothing more than a redemption of the pledge that was given at the time of the repeal of the corn laws. He felt great disappointment and surprise that the Chancellor of the Exchequer did not think it his duty to deal this year with the malt-tax, even to a small extent; but, as the right hon. gentleman had attempted to deal with it on a former occasion, the opinion of the House would doubtless carry some weight with him, and he might be induced when opportunity offered to make another attempt. In his own county this tax bore most unjustly upon those who paid it. The proportion of land under barley there was 138,496 acres, the whole acreage of the county amounting to 405,000 or 406,000. The tax prevented barley being grown to advantage, as it might otherwise be; it prevented the use of malt in the feeding of cattle; and such a tax would not be tolerated by any other branch of industry or manufacture (Hear, hear). He hoped the committee would inquire among other things how the tax affected consumers, upon whom it was a heavy burden; and how far cottage brewing would be resorted to if this tax were taken off. He believed that cottage brewing would be universally adopted if the tax were abolished, and that a great boon would thereby be conferred upon the labouring classes both of town and country with whom beer was not a luxury, but a necessary (Hear, hear).

Mr. H. E. SURTEES regretted that during the last four years the surplus revenue had not been appropriated to the repeal of the malt-tax. The present committee would, he believed, convince even sceptics of the objectionable nature of the tax. Was it just that the same tax should be laid upon barley worth 30s. or 35s. as upon barley which sold for 50s. and 55s.? Was it in accordance with the sound principles of taxation to impose burdens upon raw material, and deny to the agriculturist that freedom which was so strongly advocated for all other industries? It was said that the repeal of the duty would only affect the price of beer to a small extent. But to the duty of 21s. 8d. must be added the maltster's, the factor's, the brewer's, and the publican's profits on the duty and accumlations Nor was this all. If any person now wished to commence business as a brewer he must have a much larger amount of capital than would be otherwise requisite. In this way the brewer's monopoly was promoted, and the repeal of the malt-tax would, therefore, strike a blow at the brewing monopoly, and knock down the price of beer. He hoped that the committee, which would probably be granted, would enter fully into all the bearings of the question, and institute the fullest possible inquiry. (Hear, hear).

Mr. BEACH would remind the right hon. gentleman the member for South Lancashire that our manufacturers could export beer and undersell other producers because they obtained a drawback upon the duty, the result being practically that they paid no duty at all (Hear, hear). He was very glad that they were going to have an inquiry into the question, because hitherto the advocates of the repeal of this tax had had little opportunity of expressing their views, that opportunity occurring but once in the session, when a night was set apart for the consideration of this subject. To many hon. members it appeared that the abolition of the malt duty would necessitate the imposition of a beer duty. Such an alternative, however, he believed to be undesirable. Previous to 1830 there existed both a malt and a beer duty. By the former a revenue of about £3,600,000 was raised, and by the latter about £3,000,000, so that the difference in amount was scarcely an element in the consideration of the respective taxes. At that time it was urged that on each quart of beer the beer duty was three-quarters of a penny. Every million of duty removed would take from the price of the quart one-quarter of a penny, while a million of malt duty removed would only lower the price one-twelfth of a penny. Mr. C. Barclay referring to the matter said the removal of the malt duty would save the public ½d. per quart in the price of beer, while the removal of the beer tax would lower the price 1d. He was quite satisfied by the removal of the beer duty the country would be benefited to the amount of upwards of £4,000,000. The Chancellor of the Exchequer of that day arrived at the conclusion that the abolition of the beer duty would confer the greatest relief on the community. Still the matter was one worthy of attention; and if it was found at the present time that a beer duty would press less heavily upon the public, they might by all means change the nature of the tax; but until the conclusion arrived at at that time could be impeached, it would, in his opinion, be useless to contemplate such an alteration. He did not think that those who were anxious for the repeal of this tax could be accused of indulging in any very exacting language upon the subject. The most that they had asked for was that the case might be considered when an opportunity was offered by the discovery of a surplus (Hear, hear). He trusted that the labours of the committee would result in the reduction of this tax, and that this favourite, though not most favoured, production of the English soil might grow free and unfettered.

Lord E. CAVENDISH admitted that the malt-tax was a heavy burden, and therefore did not desire to say a word against the justice of the claim of the advocates for its repeal. But he could not help comparing the tone of their speeches now and when the late Government was in office. After the able speech of the hon. member (Mr. Read) it would be impossible for a select committee to throw any more light on the subject. The hon. and gallant member for Sussex had the fairest right to move for such a committee, but where now were the hon. members for Essex and Hampshire? Seated on the Treasury benches now, did they propose to state that it was only the implacable hostility of the right hon. gentleman (Mr. Gladstone) which stood in the way of a reduction of the malt-tax? (Hear, hear.) Those hon. members used to say that there was a limit to the forbearance of the agricultural classes, and that if the Chancellor of the Exchequer refused to take heed of their claims there would be a general agitation throughout the agricultural districts. Was referring the subject to a select committee the most prominent manner in which the subject could be brought before Parliament? Did the member for Essex (Mr. Du Cane) still think there was a limit to the forbearance of the agricultural classes, and that there would be wide-spread agricultural agitation if the Chancellor of the Exchequer still ignored their claims? (Hear, hear.) The right hon. gentleman had not entirely ignored their claims, because in his budget-speech he had stated that the only class suffering under a grievance was the agricultural class; but by adopting the measures of the right hon. gentleman (Mr. Gladstone) he had prevented any surplus becoming available for the reduction of the malt-tax, and therefore he could now hold out no hope which would not be delusive.

Mr. CORRANCE thought that this tax pressed most injuriously upon a certain class of the community. Both the producer and the consumer regarded the tax as a serious drawback; the producer was a consumer as well (Hear), as in some cases it was the practice of farmers to pay their labourers in malt to the extent of 2s. a week; but he chiefly opposed the continuance of the tax in the interests of the labouring classes—the much-talked-of working-man, who had been described as "a venal serf." Wages, it was known, had risen largely throughout the country. If the rise had been occasioned by increased produce it was good; but if wages rose because demand increased, and rose still more because labour left the agricultural market, all economists knew that at a certain point that state of things must cease, and in his county affairs had almost come to that pass. These reflections he commended to the consideration of Freetraders (Hear, hear). In the course of the agitation for the repeal many deputations waited upon the Chancellor of the Exchequer; they had been small and large, and varied in temperament, but on one occasion they actually became convivial—a member of the deputation produced a couple of bottles of beer, a corkscrew, and a glass, and the Chancellor of that time (Mr. Gladstone) took a glass (laughter). Upon that occasion he professed a liking for Bass, and it was to be hoped that the recollection had not beem embittered by late events (renewed laughter). They had been told that the tax was too large to sweep away at once; that the last surplus was too small to permit of dealing with the malt-tax satisfactorily; and that, unless it were dealt with in a comprehensive manner, it could not be dealt with at all. He was, therefore, afraid that the farmer must wait; but where were the financial reformers, the lovers of direct taxation, the political economists of the House (Hear, hear)? He supposed they had gone to dinner; they always seemed to be seized with hunger when this subject was under discussion. But when would the farmers get redress? Perhaps when they enjoyed reform, or when a perennial Chancellor of the Exchequer had paid the national debt, or perhaps when the famous New Zealander, sitting on his broken arch, sketched the ruins of Barclay and Perkins, and wept over the memory of Bass (laughter).

Mr. MORE contended that if the plea of insufficient surplus were admitted the late Chancellor of the Exchequer could not be blamed for having failed to repeal the tax. He felt convinced, however, that if the malt-tax were never to be repealed until the surplus equalled the revenue obtained from the tax, it was high time the farmers altered their tactics. One argument for the repeal which weighed with him was the acknowledged fact that drunkenness arose rather from adulteration than from beer itself; but he hoped the Chancellor of the Exchequer would state whether in his opinion it was possible to deal with the question by putting the tax upon beer, and whether he anticipated good results from the committee proposed. Unless something were done in the matter he was afraid the farmers of the United Kingdom would charge them with making their question "a political plaything" (Hear, hear).

Mr. GREENE supported the motion for a Select Committee, believing that the investigation, if gone into fairly and dispassionately, would have the effect of convincing the farmers that the malt-tax was no hindrance to them whatever. Taking into account the average price of barley for seven years, there would be no complaint on that head (Hear, hear); and the taxation levied operated directly to the advantage of the finer qualities of barley, no difference being made between barleys of 80 and 90 per cent. As to the brewing of beer at home, the greater portion of the artisans in large towns had no means of brewing at home, even if malt were given them for the purpose, while the labourer in the country, if taxation were reduced to a price which would enable him to consume beer at home, could not sit down to drink it by himself and deny it to his children. It was a hardship undoubtedly upon the farmer that he should be compelled to pay duty upon barley which he had grown himself and wished to convert to his own use. But as to this being a poor man's question, if the tax were placed upon beer instead of on malt, would not the poor man, as the consumer, eventually have to pay the duty? (Hear, hear). There had been no petitions to that House from consumers of beer, and no meetings held by them to agitate for the reduction of the duty on malt. It was said that if the duty were taken off, inferior kinds of barley would be brought into use; but against this advantage must be set the very strong competition in the shape of foreign barley which would be poured in (Hear, hear). The question of malt duty was not one into which free-trade principles properly speaking entered, seeing that there was no prohibition of foreign importation. The tax, again, was defensible on another ground; it was paid, to a large extent, by a class of well-to-do artisans not otherwise reached by taxation (Hear, hear).

Mr. BARROW said that hon. gentlemen opposite were always anxious to remove duties from raw material about to be manufactured. Why should they refuse to act on the same principle with regard to the farmer, from whom excessive duties were raised upon articles which he had himself produced and sought to utilize? (Hear, hear). He had always opposed, and should continue to oppose, a system under which upon small farms an amount of taxation was levied considerably greater than the amount of the property-tax? (Hear, hear).

The CHANCELLOR of the EXCHEQUER: The hon. member for Shropshire has said that he expects Her Majesty's Government to inform the House what their intentions are, and he also particularly wished to know whether we believed it would be practicable to exchange this tax for a beer tax. If the Government were prepared to give this information to the House, it appears to me that there would be very little necessity for the committee which has been moved for (Hear, hear). The hon. member for Shropshire also informed us that very great disappointment is felt among the various classes connected with agriculture in consequence of Her Majesty's Government not having repealed the malt-tax. If there be that disappointment, I can only say that the character of the working-classes has changed very much since I had an intimate acquaintance with them. I believe all the leading members of that class are men of much too great capacity, and are too well acquainted with the subject, to suppose that Her Majesty's Government intended to repeal the malt-tax with the surplus which it was my duty this year to bring before the House. These are somewhat careless and exaggerated statements, and I do not think they will at all advance the cause to which the hon. member for Shropshire devotes the whole energies of his life.

Mr. MORE: I never made that statement (laughter).

The CHANCELLOR of the EXCHEQUER: The hon. gentleman, from the interest that he takes in the subject and the enthusiastic manner in which he expresses his views, must be impelled, I think, by some feeling of that character ("Hear" and laughter). It is not in my power on this occasion to gratify the curiosity of the hon. member. The motion of the hon. and gallant member for West Sussex I regard as a very proper and prudent one. I do not oppose it; on the contrary, I approve it. A long time has now elapsed since the incidence of this tax was investigated. Since then the information which we possess has very much increased; the progress of the public mind generally upon questions of taxation has been very great. I believe that if this investigation is proceeded with in a spirit of earnestness, the results, whatever they may be, and the conclusions to which the committee may arrive, will be productive of public advantage (Hear, hear). There is another reason why I think my hon. friend the hon. member for West Sussex is wise in the course he has taken. We have now had for several years motions made in this House leading directly to the repeal or partial repeal of taxes, and those motions have always been defeated. Their character has not been accurately described by the noble Lord who addressed us, and who is also, I believe, a member for the county of Sussex. They were not amendments for the absolute or partial repeal of the malt-tax, but only sought from the House an expression that in any future reduction of indirect taxation the malt-tax had a superior claim on the consideration of the House (Hear, hear). I believe that during the time these motions have been made no considerable reduction of indirect taxation has been proposed, certainly not by the present Government; and, therefore, the course my hon. friend has adopted to-night is a wise one, because it no longer continues the system of making year after year a motion apparently leading to the reduction of a particular tax, but which you know can be encountered by the same arguments, will only lead to the same conclusion, and hence does not at all advance the question or at all enlighten the public mind. With regard to the question itself, it is unnecessary for me to enter into its merits, as the proposal for a committee is acceded to by the Government. But, with regard to another observation made by the noble Lord the member for Sussex, I must also venture to question the accuracy of his recollection, because he said that I described this tax as a burden on the agricultural interests. I did not use the word "burden," nor did I use the words "agricultural interests" (Hear, hear). I said that the malt-tax was a restriction on the industry of the producers of barley, and I should like to know whether any one will rise in this House, wherever he may sit, and deny that proposition (cheers and laughter). After all the other changes that have taken place, there can be no doubt that this is one of the most considerable restrictions on the industry of any producing class (cheers). That proposition can hardly be controverted. And yet, though it may be perfectly sound and true, there may be reasons which render it politic and expedient still to retain that tax. After the very considerable time that has elapsed since there was a complete examination of this subject, and after the variety of motions made on it and the very extravagant views that are taken, as I think, either way, it is my opinion and that of my colleagues that it is expedient this committee should be granted. I hope it will be efficiently constituted, and with that view, the Government, as far as they can do so, will assist my hon. and gallant friend in its formation. It is of course most desirable that such a committee should command the confidence of the House. With regard to the language in which the motion is couched, I cannot advise my hon. and gallant friend to adopt the suggestion of the right hon. gentleman opposite. I think that by so doing he would involve himself in subjects of great difficulty, while an inquiry in the terms of the motion is one which a Select Committee may readily carry out (Hear, hear). On the part of the Government, I am satisfied with the language adopted by my hon. and gallant friend, and I have only to repeat my wish that the labours of the committee may be very advantageous (cheers).

Mr. DODSON hoped his hon. and gallant friend would not extend the subject of his inquiry to the question of the spirit duty. The spirit duty was a duty on a manufactured article. The malt duty was a tax, not on a beverage, but on barley and on malting. It was a duty, not on the manufactured article, but on the raw material. There was no reason therefore for making a comparison, still less was there any reason for alleging that the two taxes were of a similar character. He did not suppose that there were two opinions as to the duty on spirits. It was universally admitted that spirits might legitimately be taxed to the utmost extent to which taxation might be carried without decreasing the revenue derived from the article. But beer, if not a necessary, was one of the comforts of the people, and consequently it was not to be taxed, except as a matter of necessity in the raising of a revenue sufficient for the wants of the country. It was said that if Parliament dealt with the malt duty without dealing with the duty on spirits, it would be doing an injustice to those counties in which spirits were consumed, and conferring a favour on those in which beer was the ordinary drink. That allegation would have force if the House were dealing with a compulsory tax like the income-tax, but an indirect tax was an optional one. Besides, if the argument was good for anything, how could those who used it justify the exemption of cider from any taxation whatever? The fact was that a liquor like spirits could not be regarded in the same light as a beverage like beer. He confessed he should have thought the better course would have been to bring the subject of the Malt-tax under the consideration of the House by a direct motion. He did not think much information was to be elicited by a committee; but, as the Chancellor of the Exchequer had made his financial statement for the present year, he was glad his hon. and gallant friend had got his committee, which he hoped would make its report in time to have an influence on the Budget of next year (Hear, hear).

Mr. BROMLEY, although regretting with the hon. gentleman who had just sat down that the question of the Malt-tax had not been brought under the consideration of the House by direct motion, thought that they must be thankful for small favours, and accept the Select Committee as a possible means of obtaining the end which most of the county members had in view (Hear, hear). But he took this opportunity of alluding to a circumstance which had come to his knowledge in respect of the hon. member for Shropshire. As he had been informed—of course, if he was incorrect, the hon. gentleman would set him right—the hon. member went down to his county (Warwick) the other day, and took advantage of a meeting of the Chamber of Agriculture to call attention, in the first place, to the absence of the four county members.

Mr. MORE assured the hon. member that he had done nothing of the kind.

Mr. BROMLEY hoped the hon. gentleman would give a satisfactory answer to what he was going to further state, As he was informed, the hon. gentleman had stated at the meeting in question, that by their absence on that occasion, and by other ways in that House, the four members for the county had shown their insincerity. He was not sure of the exact words.

Mr. MORE must inform the hon. gentleman that he had made no such allusion to the county members (a laugh).

Mr. BROMLEY accepted the hon. member's denial as quite satisfactory. At the same time he must acquaint the hon. member with the fact that he was reported in the county papers to have made the statement to which he had just referred. He hoped therefore the hon. member would inform the editors that the report was incorrect, and would advise them to withdraw it (a laugh and Hear).

Mr. AYRTON wished to ask the hon. and gallant gentleman the member for West Sussex whether, under the terms of their appointment, it would be competent to the Select Committee to thoroughly inquire as to the expediency of levying a duty on beer instead of on malt. He desired to protest against the assumption of the Chancellor of the Exchequer, that the Malt-tax was a restriction upon the industry employed on the growth of barley. He believed one of the great advantages to be derived from the labours of the Committee would be that that assumption would be shown to be entirely erroneous and unfounded.

Colonel BARTTELOT said he distinctly understood that the Committee would be competent to make every inquiry with regard to the possibility of placing the tax upon beer. Indeed, he believed that the Committee would be at liberty to inquire into every other circumstance connected with the Malt-tax. He must say he was astonished at the suggestion made by the right hon. gentleman the member for South Lancashire that the Committee should also inquire into the question of spirits. The two things were wholly dissimilar, and he thought the motion which he had made would best suit the convenience of all parties (Hear, hear).

THE PARIS UNIVERSAL EXHIBITION OF 1867.

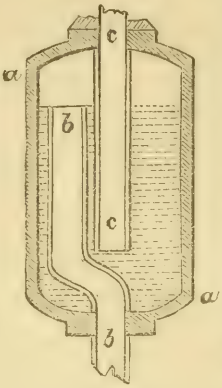
The more we see of this Exhibition the more fully convinced are we that it will, when all its departments are completely finished, work out to be one of the most comprehensive, as it is already the most extensive collection of objects connected with the arts, sciences, and manufactures, which the world has ever seen, and which it is just within the range of possibility that the world will ever see. For not only from the fact that these Expositions — of which this is the grand exemplar and culmination of efforts—have followed each other so rapidly during the last ten or fifteen years, that the probability is that, as things work in cycles, or are in some measure epidemic, and naturally work themselves out, so this eruption of Expositions—if we may be allowed to use the term—which has been prevalent amongst us of late, may die quietly out, to be revived, if ever revived again, some twenty years hence: not only, we say, from this fact, if it be one, which we incline to think it is, but also from the ominous signs which are daily gathering around us, that there will be very speedily, probably before this same season in which we write comes round again, a general disruption of the peace of Europe, at least of the continent; we are much inclined to believe—and the belief is shared in by not a few, both here and in our own country—that this will be the last of the Universal Exhibitions, that we are all the more urgent with those of our readers who have the time, and the necessary adjunct of a well-filled purse, to come over and see it. Nor, if the present time be the most convenient, need they put off their visit, and run the risk of something coming in the way which may prevent them making it at all, from any notion that things are in such an incompleted state that the visit is not worth the making. True, there are faults of omission and commission in this undertaking, but what work of man is not so distinguished? and although we have freely found fault where fault really existed, or in our mind or to our thinking existed, we no less freely admit that, in our view of the really grand and comprehensive character of the Exhibition, the faults are so few and unimportant that they may well be lost sight of. Each day's travels either through the interior of the vast building itself, or through the as marvellous collection of structures in the park surrounding it, only serve to show how much there is to be seen; how difficult it is—if, indeed, it is not impossible—for any one, even within the limits of as extended and as systematic a visit as we have paid to it, to see all, or anything like all, which the building and the park contain. We seem to have thoroughly exhausted the objects of interest to-day; we visit it to-morrow only to find out how much remains to be examined. We shall, therefore, be compelled at once, by the exigencies of time and of space, to forego giving our readers much of what we purposed giving them when we announced our series of papers. We must, then, try to give not merely the cream of the whole, but, as the French say, "the cream of the cream." From what we have said in favour of the Exhibition and its departments as a whole, the reader will be prepared to believe that our opinion of the department at the island of Billancourt devoted to the exhibition and trial of agricultural stock and of implements and machines will be an honest and candid one. We regret to say that it is not a very favourable one. We perhaps scarcely go the length which one of the committee expressed to us—that it was a failure, a marked failure; but at any rate we may say that, up to the present time, it has very much of the characteristics of this untoward appellation. We regret this all the more from the fact that the programme of the arrangements of this department, promulgated before the opening, and of which we in our first paper gave a *resumé*, led us to expect great things as its result. It is quite possible, however, that as time progresses things will assume a more favourable aspect, and that the department at Billancourt will prove to be what it certainly promised to be—one of the most practically suggestive, if not one of the most popularly interesting, of the Exposition. The island is some four miles, or perhaps three miles, only from the Exhibition, down the Seine, and is not easily reached. Omnibuses run every hour, but are slow, and there is a small steamer which leaves from one of the bridges near the Louvre. The surface of the island is pretty extensive—so extensive, indeed, that what is to be shown on it not being very great in appearance, is dwarfed into such miserable proportions that the collection looks even more meagre than it in reality is. The section of the park is devoted to the sheds, or hangars as they are called, in which the stock is to be exhibited—these being by no means numerous or indicative of a large assemblage of animals; and of other sheds which are occupied, or are to be occupied, by collections of implements and machines. Many of our leading houses exhibit here, as well as in the Annexe in the park at the Champ de Mars, and display in their collections by far the finest examples of agricultural machines and implements met with in the island. The collections of French makers are pretty numerous, and, upon the whole, good; only a few isolated instances, however, being met with where workmanship and design of the practical character of ours can be witnessed. There are to be picked up from this continental collection a few novelties which are worth noting, and which being so, we have noticed, and the result of which we shall in due course present to the reader. Part of the section of the island now under notice is devoted to a garden, very prettily laid out, in which specimens of various modes of training fruit trees are to be exhibited. At another part of the park there is to be, for it has no existence as yet except on paper, an exhibition of different appliances connected with bees, or what the French generally call "apiculture." On the other section of the island a large space is devoted to the exemplification of different modes of cultivating crops and of laying out of land; while in the neighbouring island of Séguin the trials of implements and machines are to be carried out; while we may remark, in passing, that these were to have been begun on the 1st of the month, but from the disarrangement of the whole programme of proceedings they do not begin till the 23rd—with what practically useful results time will show.

In presenting to our readers notices of the novelties of the Exhibition, we do not intend to follow up any systematic division of subjects. A systematic examination we have, of course, made of the whole; but space, if not other considerations, preclude all possibility of our giving as the result of this a complete and systematic *resumé*. Enough it will be for the purposes we have in view if we pick up here and there, so to say, some things which present themselves to us as worthy of special notice.

In our last paper we took occasion to point out the influences which were at work in modifying the peculiar arrangements of implements and machinery used in different countries, and even in different localities in the same country. Many examples of the truth of this will be seen throughout the Exhibition. In the American Annexe, displaying by no means an extensive collection, yet suggestive withal, there is a small collection of ploughs, which are worthy of notice in this respect. They form part of the exhibits of Messrs. Collins and Co., of Hertford, in Connecticut. The principal features in the plough now under notice are the mould-board and the absence of what we consider to be an essential part of a plough, namely, a coulter. The mould-board is of cast-steel, highly polished; its contour is very unlike our ploughs, being very concave—so much so as almost to form part of a circle; the sock is long and sharp, and the slope of the back part of the mould-board is very considerable. In designing this plough the aim of the inventor has been to arrive at a form of mould-board which will cause the slice to roll or turn over with as little lifting as possible; as he conceives it takes less power to cause a body to roll over than to lift it up and to pitch it aside. The instep of the mould-board is so high that the landside of the furrow-slice commences to rise the moment it is cut, the other side being kept low. This plough, both from the apparently excellent quality of the steel with which it is made, which at the same time is exceedingly hard and yet malleable and as easily worked by any smith as common iron, and from its peculiar form and general simplicity of appearance, is worth examining from our point of view.

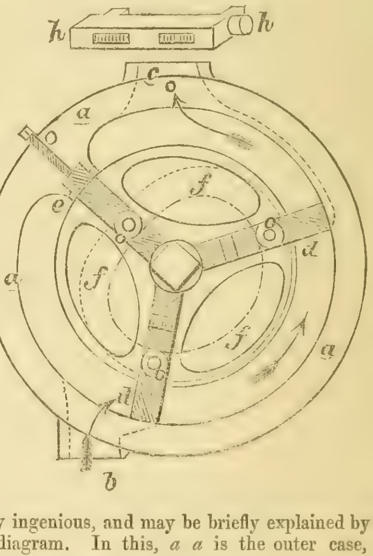
Nearly opposite the stand of Messrs. Collins is that of the Messrs. W. and B. Douglas, also from America, and who exhibit a pretty extensive collection of hydraulic apparatus, some of which are worthy of brief notice. Amongst other things, is a very simple attachment to a pump—the want of which has doubtless been often felt by farmers. It is represented in section in Fig. 1, and is called a "water charger," being designed to obviate the inconvenience of the pump getting off working through the water in the barrel leaking through the valves and leaving them dry, or when the water is purposely let off in winter to prevent freezing, so that there is a difficulty in again getting up the vacuum, and frequently a necessity for pouring water down the barrel to set the valves in order. All the inconveniences arising from this are proposed to be obviated by an appliance in Fig. 1, by which a supply of water is retained close to the pump in the vessel *a a*, and which is easily and at once sucked into the pump through the pipe *b b*, when this is set to work, wetting the packing of the valves, and causing them to draw. The vessel can be placed so as to be without the reach of frost, and it also possesses the great advantage of acting as an air-vessel, or chamber, equalising the action of the pump, and forcing up a continuous supply of water through the delivery-pipe *c c*.

Fig. 1.



Messrs. Douglas also exhibit their improved rotary pump, of which we give a section in Fig. 2. The means by which in this pump the working arms are kept perfectly packed, and yet work with the minimum of friction, are very ingenious, and may be briefly explained by means of the diagram. In this, *a a* is the outer case, *b* the suction, *c* the delivery-pipes, *d d d* are the revolving arms and valves, which are provided with small friction-pins, which run in the eccentric-groove *f f f*, and are thus forced to keep a determinate path. The line of movement of this eccentric curve is such that at one part of their revolution the arms just pass, but pass tightly, against the projecting part *e*, which is made capable of adjustment by a small screw. The water carried rapidly round by the arms *d d d*, is arrested by this stop, and is thrown up the delivery-pipe *c*. The friction of the arms and valves *d* is reduced to a minimum by providing the valves with passages, as shown in separate diagram at *h h*, these passages being made from front to back, and permit the pressure to be equivalent on both sides. The working of the pump is so adjusted that the valves only move when the pres-

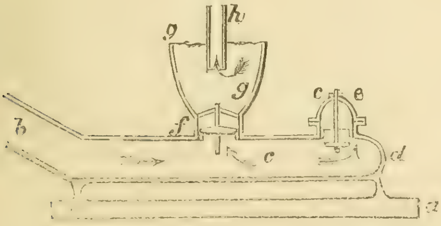
Fig. 2.



sure of water is thus equalised on both sides, so that they slide in and out as they move round the path of the eccentric-groove *f f*, with the least possible amount of friction. This pump has been very largely patronised in America: it is made of all sizes—sufficient to empty a barrel or work a large well. A pump of 5½ inches diameter, and worked at such a speed as to make 150 revolutions per minute, will lift and force 20 gallons per minute, or 1,200 gallons per hour.

We have, in the pages of this Journal, advocated more than once the utilization of the small streams of water which are found in such frequency in many districts of our country, and which are unfortunately allowed to run too often to waste, so far as their capabilities are concerned of affording a source of water-supply at pressure, available either for the extinguishing of fire, the supply of cattle, courts, &c., &c., or the working of a small turbine for power purposes. The Americans have long had the practice of introducing a number of appliances within this department, one of which we only here allude to, and that is the "hydraulic ram." Messrs. Douglas exhibit a very well arranged form of this apparatus, adapted for rural purposes; and there is also in the Park another good form exhibited by a French engineer. To those of our readers who may not be acquainted with the advantages derivable from this apparatus and its mode of operation, the following brief remarks may be interesting and useful: In some localities small streams of water, having only a small amount of fall, may run through a part of the farm, situated at some distance from the house or the homestead, where the supply is required. The problem is to take the water from the place where it is not, to the place where it is, wanted, and to make the water itself yield the power by which it can be transported from the one place to the other. This problem is met in an exceedingly simple manner by the use of the hydraulic ram, an invention of the celebrated Montgolfier, in the last century, in which the momentum generated by water removing from a high to a low level is made use of. This momentum is very simply illustrated in a way which has doubtless come within the experience of the majority of our readers, in the case of suddenly shutting a water-tap which is placed below the level of the cistern with which it is connected: a shock is felt, the severity of which is regulated by the height of the column of water in the pipe, and the suddenness with which the stream of water running full through the tap has been stopped by turning the tap. The simple diagram in Fig. 3 will illustrate the ordinary arrangement of a hydraulic ram, where *a a* is to represent the stand or base, which is secured properly to a firm foundation of stone, timber, or brick; *b* is the pipe which leads the water of the stream to the chamber of the ram. At the further extremity, or end *d*, of the chamber a valve *c c* is placed, which is capable of falling of itself, and thus remaining open so long as free to do so. The valve *f* is in precisely the opposite circumstances, it keeping closed by the weight of the water in the air vessel *g g*: *h* is the delivery-pipe through which the water is forced up to any place desired. The action is as follows: The water, entering by the pipe *b*, passes along the chamber of the ram till it meets the end *d*: it is arrested by this, and recoiling, finds a passage through the open valve *c c*; the water, however, gradually recovers such a degree of momentum that it closes the valve *c c*, and, finding no outlet through it, it lifts it up, and escapes through the valve *f*, running into the air-vessel *g g*, from which it is forced by the pressure of the air contained in the upper part of the vessel. It is scarcely necessary to say that the greater the fall, or descent, of the stream which is used to work the ram, and part of which it is desired to raise to a higher level, the more economically is the apparatus worked, or rather, the greater the quantity of water forced up in a given time. And yet the apparatus is useful even in cases where there is a very low fall. A two-feet fall will raise water to a height of one hundred and fifty feet above the level of the apparatus, and to a greater height or distance than this—only, of course, with a proportionate decrease of the quantity delivered in a given time; for the greater the distance to which the water is sent the greater the loss occasioned by the friction of the water in the pipe. In using the apparatus, however, it is desirable to arrange for rather a slow speed of working, so as to keep down the wear-and-tear. There is one great advantage in it—that it works night and day, with actually no supervision and no outlay. As a moderately correct approximative rule for estimating what amount of water can be raised by a ram, it may be reckoned that where the height to which the water is to be delivered is five times the fall of the stream which works it, one-seventh of the whole quantity of water passing through the ram will be forced up to the point of delivery. By forcing water by this apparatus to a cistern placed at some high point of the farm building, water at pressure may be obtained for various purposes, as, for example, the working of a small turbine to work the chaff-cutters, &c., &c., than which application of a stream of water, which otherwise might be allowed to run unheeded away, we know none more economical or advantageous. We have yet many lessons to learn in the administration of power for farm purposes; and some may be taught by more than one of the departments of this Great Exhibition.

Fig. 3.



It cannot be otherwise than a satisfactory, as it is quite a legitimate, feeling for one to have, who has been called upon to record the doings and the progress of a great undertaking, to find that although his views regarding it might not be nor were in accordance with those of the majority, still that these views were in the main so correct that they were ultimately held by those who had not at the first agreed with them. Such satisfaction, in degree more or less limited, is ours; for although we did not hesitate to find fault where fault we conceived existed with several points connected with the Great Exhibition of 1867, we nevertheless, from the first survey we had of its contents, did not hesitate to say that they were remarkably good, using indeed, if we mistake not, the term "wonderful" as applied to them, and using it advisedly; and that, even although certain departments were not completed, these, indeed, were so few and so unimportant comparatively that the faults of omission were completely crowded out of one's mind in view of the deeds of commission, so to call them. And as the willing work of so many hands is each day telling upon the completeness of the whole, each day the term eulogistic, as it may be deemed by some, which we have applied above to the whole, becomes more and more applicable; and many critics, who probably conceived that they did not deserve the name if they were not critical, are beginning to admit this, although for our part we can suppose no other thing than that they must have long ago been personally convinced of it. But be all this as it may, certainly those of our readers who now purpose visiting this Great Exhibition, and who may allow themselves by trivial considerations to be persuaded not to go, will assuredly regret not carrying out their original, and, as we conceive it to be, their wise determination. In place of prices advancing as the season advances, we incline to the belief that they will, if not recede, certainly not advance beyond their present figure. We believe that many hotel-keepers and owners of apartments are already finding out the mistake they have made in asking so much for their accommodation. Combinations to keep up prices are all very well if the combinations themselves are kept up—an important point, as some of them are already finding out; for black sheep are already beginning to disturb the repose of the flock, and combination is giving way before competition. Apartments may and likely will be a little dearer than ordinary times, but living itself will not be. For our part, we have lived during this visit as cheaply as we have done on any former visit to Paris. Of course we have lived as the Parisians themselves do, carefully avoiding all the English-frequented hotels and houses. This we may remark in passing is the grand secret for living cheaply in Paris, and for seeing not an English, or rather half-French half-English, neither fish, flesh, nor fowl side of Paris life, but the out-and-out style, "native and to the manner born." Take a room then in a French house, and dine outside. This is, of course, easier done by single gentlemen than married, who may take their wives, daughters, or sisters with them; but it may nevertheless be done, and done comfortably, even with them; and it may also be supposed to involve a knowledge of the French language. But this also may be got over if even a "smattering" is possessed by the visitor, and who, like a sensible fellow—all our readers are in this class, of course—can take things pleasantly as they turn up, and who does not act the "grand Pacha." Living thus, and going into all kinds of refreshment places, cheap and dear, as occasion and opportunity serves and admits—but always French ones, avoiding as you would the plague those flocked to by English, and whose announcements, more plain than true, are made that "English is spoken here"—avoiding these places, we say, and choosing the native ones, you will see more of Paris and of French life in a week than you would see at the "Grand Hotel du Louvre" or the "Hotel Windsor" in a year. And to a sensible fellow, whose object is to see as much as he can, and not to throw money away, as if his only object was to show to "beggarly Frenchmen" that he had plenty of it, and did not care for spending it, there will be this great difference—that of the two styles of living in Paris above noted, the best will be the cheapest, a conjunction not always to be met with. We make no apology for all this advice, for we know that it is worth something: we have followed it, and our experience of Paris and continental life has been—well, we may say briefly, pretty extensive.

In returning to more sober if not to more interesting matter, we draw the attention of our readers to the fact that our last paper was occupied by descriptions of some hydraulic apparatus exhibited. Before going into other departments it may be as well to conclude here what we have at present further to say in connection with this class of appliances; and before doing so we may draw attention in a brief sentence or two to what has been done in connection with the supply of water for the various purposes of the Exhibition. When one brings to recollection the old place of the Champ de Mars with its hard gravelled surface and its flat expanse, and looks now upon the same ground, diversified in surface and laid out with admirable taste, with a river or rivulet flowing through part of the ground, its lakes and its flowing cascades, we can gather easily enough that no small amount of labour in connection with the water or hydraulic department of the Exhibition must have been incurred before those could have been created, and that no small amount of labour must be daily involved to keep the whole service at work, more especially when we consider that that service includes the supply of the numerous boilers throughout the park which supply steam to the machinery-gallery, as well as the supply necessary to show the working of various hydraulic machines, and also the service of the refreshment rooms, and for watering the floors and passages. The quantity required per day is estimated at 10,000 cubic metres. Half of this quantity is required at pressure—a height or head obtained from a column of water from 20 to 25 metres being necessary; the other half at a pressure only high enough to enable the water to clear easily the jets and orifices at a low level. The water at high-pressure is obtained from a reservoir, which contains 4,000 cubic metres (a metre may be estimated at one yard and an eleventh of a yard) placed at the heights of the Trocadero near the avenue Malakoff, the magnificently broad steps leading up to which are seen directly facing the grand entrance of the Exhibition. The height of the reservoir above the floor of the Exhibition is 32 metres. The water for the service of the boilers and for other purposes is provided by a magnificent steam-engine of 1,000-horse power, and which is capable of supplying daily 12,000 cubic metres. If necessary this engine is to be assisted by another grand engine of a French engineering company, and should both get out of order at the same time or be disabled from work, other and special hydraulic apparatuses are provided. The two gigantic engines above alluded to are placed in a shed alongside of the Quay bordering the Seine, and are well worthy of a special visit to see. The visitor will require to leave the park near the light-house, and pass under the bridge which will take him to the banks of the Seine, on the Quay of which he will find the shed towards the left hand. On the Quay to the right he will find a shed containing specimens of wager-boats, models of yachts, and in another shed a diving apparatus. All these are worthy of notice. In connection with the water works MM. Neut and Dumont exhibit, in working order, one of their centrifugal-pumps. This is on the principle of Appold's form, well known in this country, in which the arms are curved. Rapidly as this form of pump came into use with us, it was some time before it was appreciated in France; and to the exertions, indeed, of MM. Neut and Dumont, its wide introduction into that country is indebted. In less than four years they have sent out no fewer than 2,000. MM. Neut and Dumont have introduced sundry improvements in the form of pump as originally invented by Mr. Appold, all of which seem to act well, and render the pump very economical in working. Messrs. Gwynne and Co., of London, exhibit a centrifugal pump, in which the arms are curved slightly in place of being flat or straight, as in Appold's pump above alluded to. This pump of the Messrs. Gwynne is in conjunction with a small steam-engine, which works it, both being fixed in one bed-plate. The arrangement shows many points worthy of notice by mechanics. The balancing of the whole has been specially attended to. This has been remarkably well secured; so much so that, in a trial in which the engine and pump were not bolted down, but merely rested upon some pieces of iron and timber, it was run at a speed of nearly 600 revolutions per minute, and yet worked very steadily and without vibration. These pumps have been much introduced for drainage purposes, and will no doubt be still more so on their merits becoming known.

A simple form of steam-pump economically worked, not liable to get out of repair, and yet easily put right again should it do so, has long been a desideratum in farm machinery. We believe that it is met in the form of "donkey pumps," the patented invention of Messrs. Brown, Wilson, and Co., of London, and of which a specimen at work may be seen in the Boiler House of the British Commissioners in the Park. Although introduced originally as a donkey pump, or pump for supplying boilers, it has been made applicable to a wide variety of purposes, and will, we believe, be made still more so, as its merits become better known. We believe, indeed, that it is the intention of the patentee to invent for farm purposes a small engine and boiler, which will cost but a trifle as compared with other forms now in use, and which will be easily and economically worked. The main feature of this exceedingly ingenious pump is its extreme simplicity of construction, and the consequent fewness of its parts liable to get out of order, or to add to the cost of working through loss by friction; indeed, it may be said that all the working parts are reduced to a minimum, and these are so arranged and constructed as to involve the least possible chance of going wrong, and the least possible amount of friction. The steam cylinder which works the pump and the pump itself are cast in one piece, the steam cylinder being placed at the top of the framing, with the piston-rod working downwards. This piston-rod is, in fact, a hollow barrel, the lower part of which acts as the plunger of the pump, which is of course placed directly below the steam cylinder, and occupies the lowest part of the frame-work, and which frame-work can be bolted to a wall or the front or side of the furnace of the boiler which it is designed to supply with water. The valves of the pump are spherical, and placed in cages to guide them and keep them in place. They work easily and efficiently at very high speed—with as great a speed indeed as 200 revolutions per minute—and in consequence of the comparatively large diameter which has been given to them, and to the small or low lift or rise they have in their seats, they work with very little noise. As above stated, the piston, piston-rod, and pump-plunger or ram are all in one piece, made hollow to secure lightness, and of the best gun-metal, and accurately fitted. The centre of the piston-rod or plunger carries a tapered hole, which receives the stud to which the end of the connecting-rod is jointed. This is very light, being made simply of a flat bar of hard steel. This is jointed at its upper end to a hard steel pin in the face of a polished steel disc, and which disc acts the part of a crank, and, being circular, rather adds to the look of the apparatus. The centre of the disc is screwed and pinned on to the crank-shaft (also of steel), and which revolves in bearings at one side and a stuffing-box at the other side of the cylinder-casing top. The valve apparatus for the distribution of steam to the cylinder is particularly simple and ingenious. The steam ports are cast in one with the cylinder, thus dispensing with all couplings on the valve-chest, and the valve face is on a level with the cylinder, so that both end of cylinder and face of valve can be placed at one and the same operation. The slide-valve, which is made of very hard gun-metal, is worked in a very ingenious way. On the back of the valve two horns, or projecting parts, are cast—the space between these being most accurately fitted and made smooth. In the space between the horns a small steel roller works: this is fixed eccentrically to a small disc, or crank, attached the crank-shaft of the cylinder. The eccentric motion of the roller works the valve to and fro, and, as this is very light, little power is absorbed. The whole arrangements have in view this special principle—that the work which the apparatus has to do is to pump: hence a minimum of the power is expended in working the parts which do not directly contribute to this end. In other forms of donkey-pumps a vast deal of power has been expended in merely working heavy fly-wheels, rendered necessary by the cumbrous arrangements involved; but in the pump we are now considering, the maximum of steam-power goes to the work of pumping, to ensure this the working parts being made as few in number and as light as possible. Hence a form of pumping-engine is now, we believe, within the reach of all, which, applicable to almost all kinds of work in which water is required, can pump from considerable depths with great certainty, can pump boiling, or nearly boiling, water as easily as cold water, and which is light, easily repaired, and economically worked. We believe that a very extended future of usefulness is open to this apparatus—which we would recommend the visitor to the Paris Exhibition to go and inspect for himself at the Boiler-house of the British Commission.

FOREIGN AGRICULTURAL GOSSIP.

In consequence of a ministerial circular of June 5, 1866, the prefects of twelve departements selected as the scene of the French district State agricultural exhibitions in 1868 have appointed in their several districts commissions charged with the preparation of lists each containing the names of ten agriculturists considered to combine the necessary qualifications to enable them to contend worthily for the prizes of honour and the accompanying special medals. This arrangement has been devised in order to invite to the various competitions a certain number of agriculturists who, either from modesty or from indifference or from some other motive, have not deemed it right at present to inscribe their names on the lists of competitors. At the same time, the prize of honour will none the less be a distinction which will only be accorded with very serious guarantees. In connexion with the Billancourt show, it may not be generally known that a grand prize of £400 is to be awarded to the exhibitor who, by the various products which he may exhibit, methods of cultivation, animals or implements, shall show that he has rendered the greatest services to agriculture.—The high commission charged with the duty of inquiring into agricultural affairs in France has decided on printing the various documents collected thus far during the inquiry, and on Monday last the commission commenced the examination of witnesses who are to be heard at Paris, in accordance with the fifth article of an imperial decree of March 28, 1866. The sitting of Monday was devoted to the examination of several foreign *agronomes* now staying in Paris on the occasion of the Paris Universal Exhibition, and who furnished very useful information on the state of agriculture in the countries in which they reside. Thus the commission examined in succession M. De Tcherniaeff, director of the imperial agricultural museum of St. Petersburg, and one of the members of the international jury of the Paris Exhibition; Baron De Moreau, a Bavarian agriculturist, sent to Paris to study the agricultural departments of the exhibition; M. Aureliano, director of a farm-school in the Danubian Principalities and a member of the international jury; and the Marquis Bertone de Sambuy, an eminent Italian agriculturist and one of the international jury. The publication of the principal documents collected during the inquiry is now awaited with impatience. The superior council of the international jury of the Paris Exhibition has decided that the number of recompences originally fixed—setting aside the great prizes—at 100 gold medals, 1,000 silver medals, 3,000 bronze medals, and 5,000 honourable mentions, should be increased to 900 gold medals, 3,000 silver medals, 4,000 bronze medals, and 5,000 honourable mentions.—On the 25th of the ensuing month a sale will take place at the Places farm, near Feurs, on the Paris and Lyons Railway (Bourbonnais route), of pure-bred Durhams, from the sheds of the Marquis de Poncins, and all inscribed in the French herd-book. Altogether, 12 animals will be offered for public competition.—Since the Luxembourg question has been adjusted, a number of French cultivators, who gave up to the Minister of War horses entrusted to their care five or six years since, have inquired whether the horses in question will be restored to them. They urge that the horses have attained an age which renders them unsuited for military service, and further that the decree which granted them to them declared that they should become their property after they had been seven years on their farms. In a few months this condition of seven years' service will be fulfilled.—The Isle of Billancourt, which has been given up to agriculture for the nonce, has become more animated since a regular steamboat service conveys visitors to it. It presents now a fine collection of sheep, comprising 212 lots of rams and ewes; the merinoes are naturally in a majority. A proposed competition of hay-cutting machines, &c., will not take place at Billancourt, but in the imperial farm of Fouilleuse, near St. Cloud. The competition is expected to excite much interest. This week will also be devoted at Billancourt to the examination of distilling and drainage apparatus. A competition of reaping machines will come off at the end of July; but the exact date is not yet fixed.—The Minister of Agriculture, Commerce, and Public Works has published a note, from which it appears that cases of contagious typhus have declared themselves in several parts of Germany, and particularly at Frankfort. The importation of ruminating animals, fresh hides, &c., has consequently been forbidden on the whole line of the French frontier from Lauterburg as far as the departement of Savoy inclusive. Similar restrictions continue to be applied to animals and animal *débris* proceeding from Bavaria, Rhenish Prussia, Belgium, Holland, and Great Britain.—If M. Becquerel has suspended his inquiries into hail-storms, stopping short at the limits which he had prescribed to himself, he has not suspended his operations on the other branches of meteorology, and the Central Agricultural Society of France at its last meeting profited from the reading of a *mémoire* by M. Becquerel, on the principal causes which influence rain. These causes are numerous, since they are associated with the latitude, the continental or maritime position of localities, the direction of winds according as they blow from the sea or the land, the altitude or proximity of woods, mountains, &c. A great number of savants have occupied themselves with this important question, and all agree in recognising the fact that rain proceeds from a cooling of a mass of air saturated with vapour; but M. Becquerel asked the question whether it must be admitted with Fulton that this cooling is occasioned by the mixture of two masses of air saturated with vapour and not having the same temperature? Is it enough to produce a fall of rain that a warm wind with the maximum of humidity should traverse a cold bed of air; or must we rally in support of the theory of M. Babinet, of which M. Becquerel sums up the formula thus: When gas dilates, there is a reduction of temperature; if it expands, there is, on the contrary a release of heat. M. Becquerel appears to think that humid masses blown about by vapour are continually rising and falling; if they rise, their pressure is diminished, their temperature falls, the degree of humidity increases, and when it is at its maximum the watery vapour is condensed. Thus, when a wind blowing from the sea, and by consequence humid, meets a mountain of sufficient height, it is thrown back upon itself, the mass of air rises, gliding along the surface of the slopes, its temperature is reduced, and, according to the height of the mountain, the temperature of the air and its degree of humidity, the upper portion is liable to be plunged in mists or exposed to squalls of rain and snow, while the sun, perhaps, may be shining at the foot. M. Babinet concludes from this that, as a rule, it rains more on mountains than in valleys. M. Becquerel does not deny the consequences or contest the exactitude of the facts on which the theory of M. Babinet is based; but he restricts their application to cases in which masses of humid air, impelled by winds, meet obstacles which force them to rise. If these obstacles present little elevation, such as woods, the height of which does not exceed 26ft. to 35ft., the temperature only falls very slightly, and, in that case, the precipitation of vapour is scarcely sensible, provided, at the same time, that the temperature at the top of the trees is sensibly the same as down below. But, apart from the general causes which involve the formation and fall of rain must be grouped local causes, of which M. de Gasparin has made a special study, which enables him to recognize the fact that rains diminish in proportion as one goes further from the sea, and that, on the other hand, great chains of mountains exert such an influence that they represent really the rainy points on a geological map. Observations collected by Mr. Belgrand, on the rain régime in the basin of the Seine, prove, incontestably, that the quantities of water which fall on the sea-coast at the embouchure of the Seine are more considerable than in the valley of the Oise. After leaving Paris the ground rises slightly as far as Champagne, but the augmentation in the altitude of the land scarcely compensates for the increased distance from the sea. After leaving Champagne the altitude of the land rises rapidly and the quantity of rain increases. The same consequences have been deduced from observations made in the Yonne. Finally, M. Belgrand has also indicated a fact already reported by M. Vignon, viz., that more rain falls in some valleys than on neighbouring plains. With some exceptions, nevertheless, it must be admitted that the quantity of rain increases with the altitude of land, as was proved by numerous observations made by M. Becquerel, from 1859 to 1866, in the basins of the Loire, the Allier, the Cher, the Indre, and the Vienne. M. Becquerel certainly seems to have a prodigious power of observation—a power only equalled, in fact, by the perseverance of his industry.

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of the Council of this Society was held at Douch's Railway Hotel, Taunton, on Tuesday, April 30, under the presidency of J. Tremayne, Esq. There were also present: Messrs. R. S. Allen, R. Bremridge, R. Brent, M.D., C. Bush, R. H. Bush, Thomas Danger, J. T. Davy, R. R. M. Daw, E. S. Drewe, Mark Farrant, Henry Fookes, John Fry, John Gray, Jonathan Gray, J. D. Hancock, T. Hussey, J. Lush, H. A. F. Luttrell, Henry St. John Maule, Rev. T. Phillpotts, Messrs. S. Pitman, G. S. Poole, Henry Robertson, W. R. Scott, Ph. D., J. C. Moore Stevens, E. B. Willyams, H. Spackman (Official Superintendent), and J. Goodwin (Secretary and Editor).

The following programme of the arrangements for the forthcoming show at Salisbury, in June next, was brought up by the Secretary, and confirmed:—

Monday, 10th June, admission 2s. 6d.—Open Judging at 10 a.m. Implement Department open at 10 a.m. Arts Department open at 10 a.m. Sheep-shearing in the yard at 11 a.m. The Exhibition to be opened by the President and the Officers of the Society, assisted by the Worshipful the Mayor and Town Council of the city of New Sarum, the Bishop of the diocese, the Cathedral dignataries, the Members of Parliament for the city of New Sarum and the two divisions of the county of Wilts, and the members of the Local Committee, at 1 o'clock. Luncheon in the Pavilion at 2 p.m. Horticultural Department open at 1 o'clock. Band of the Grenadier Guards at 1 o'clock. Yard closed at 6 p.m.

Tuesday, 11th June, admission 2s. 6d.—The Sheep, Horses, Pigs, Poultry, Implements, Arts, and Horticultural Departments open from 9 a.m. to 6 p.m. Field Implements of various kinds at work, at intervals, from 10 to 3. Band of the Grenadier Guards at 11 a.m. Reception of Members by the Bishop of Salisbury at the Palace at 8 p.m.

Wednesday, 12th June, admission 2s. 6d.—The Sheep, Horses, Pigs, Poultry, Implements, Arts, and Horticultural Departments open from 9 a.m. to 6 p.m. Band of the Grenadier

Guards at 11 a.m. Bands of the Grenadier Guards and Royal Marines at 3·30 p.m. The Shoeing of Horses at Portable Forges at 10 a.m. Field Implements of various kinds to work at intervals from 10 to 3. Annual Meeting of the Members of the Society in the Council Tent at 12 (noon). Conversazione at the Council Chamber by invitation of Dr. Lush, Mayor of Salisbury, at 8 p.m.; Paper to be read by Mr. E. P. Squarey.

Thursday, 13th June, admission 1s.—The Sheep, Horses, Pigs, Poultry, Implements, Arts, and Horticultural Departments open from 9 a.m. to 3 p.m. Royal Marine Band at 11 a.m. Excursion to Lady Herbert's farm-buildings and Wilton House, under the direction of Mr. Rawlence. Members to meet at the Council Tent at 1 o'clock. Reception of Members by the Bishop of Salisbury at the Palace at 8 p.m.

Friday, 14th June, admission 1s.—The Sheep, Horses, Pigs Poultry, Implements, Arts, and Horticultural Departments open at 9 a.m. Royal Marine Band at 11 a.m. The Horses (excepting in Class 47) will remain in the yard until 3 p.m. No Poultry to be removed without special order until after 3 p.m. Horticultural Tent closed at 3 p.m. Poultry Tent closed at 3 p.m. Yard closed at 5 p.m.

On Monday the Horses will be openly judged. On Tuesday, and following days they will be paraded in the circle, for at least 30 minutes, at 12 and 4 o'clock (weather permitting).

In consequence of the decision of the Committee of Privy Council no Horned Cattle can be shown at the meeting of this or any other agricultural society during the summer of this year.

THE SOUTHERN COUNTIES ASSOCIATION.

A meeting of the above society was held at the Society of Arts, Adelphi, on Wednesday, April 24. Present, Viscount Eversley (in the chair), Hon. and Rev. S. Best, Mr. Robert Clutton, Mr. Geo. Darby, Sir J. C. Jervoise, Bart., M.P., Lieut.-Col. Lennard, Mr. Melville Portal, Mr. P. S. Punnett, Mr. J. C. Ramsden, Mr. W. Rigden, Mr. R. J. Spiers, Mr. J. S. Turner, Mr. H. Wise, and Mr. Shute, Secretary.

The following new members were admitted: Mr. Thomas Brown, Buckham Hill, Uckfield; Mr. John Clutton, Sussex Square, Hyde Park; Mr. Robert George Clutton, Sussex Square, Hyde Park; Mr. Henry Clutton, Hartswood, Reigate; Mr. C. Freeman, Park House, Reigate; Mr. Alfred Hardwick, Hangleton, near Shoreham; Mr. Henry Humphrey, Ashington, Steyning; Mr. W. Marshall, Bolney, Cuckfield; Mr. Geo. Michell, Steyning; Mr. F. Murton, Smeeth, near Ashford; Mr. Arthur T. Newman, West Dean, Chichester; Mr. James Nicholson, Dover's Lodge, Reigate; Messrs. E. and A. Stanford, Eatons, Ashurst, Steyning; Mr. W. Stanford, Steyning; Messrs. Tasker and Sons, Waterloo Iron Works, Andover.

The decision of the Committee of Privy Council, against the exhibition of horned stock at any of the agricultural meetings this summer, being final, the show-yard contract—which included standing for upwards of 150 cattle—came under the consideration of the council, and as it was stated that the entries for horses, sheep, and pigs had all been largely in excess of the accommodation provided, the following resolution was agreed to: "That the local committee be authorised to make with Messrs. Bishop, Ashford, and Hooper, the contractors, such alterations in the shedding orginally approved by the council as circumstances may require, and also to make any further provision for carrying out the arrangements for the show that they may deem expedient." On the suggestion of several members, it was resolved to issue an amended Poultry Prize-list, offering additional premiums to the amount of about £50 for birds of any age.

The Secretary was requested to invite the following gentlemen to undertake the office of judge at the Brighton Show:

Short-wool Sheep.—Mr. J. Rawlence, Bulbridge, Wilton; Mr. H. Woods, Merton, Thetford. *Longwool Sheep and Pigs.*—Mr. Joseph Druce, Eynsham, Oxford; Mr. Jesse Piper, Hawkhurst. *Thorough-bred Horses, Hunters, Hacks, and Ponies.*—Lord Tredegar and Sir Joseph Hawley, Bart. *Agricultural Horses.*—Mr. John Clayden, Littlebury, Saffron-Walden; Mr. George Franks, Cobham, Gravesend. *Poultry,* —Mr. Robert Loder, High Beeches, Crawley; Mr. John Bailey, Mount-street, Grosvenor-square.

The council then adjourned to Wednesday, May 29th, at 12 o'clock.

THE HORSE SHOW

AT THE AGRICULTURAL HALL, ISLINGTON.

The fourth annual show of horses opened here on the Saturday in the Epsom week, with an entry of three hundred and fifty. The Hall was as neat, gay, and sweet as ever; and the arrangements for the public and horses, as usual, very good. There was the old drawback as to the numbering; and as long as the horses are not numbered on both sides of the head there will always be the same complaints. The figures on the riders' hats is certainly novel; but then the riders invariably had their heads turned towards the judges, so that when they came on a line with the spectators, where the number would be readable, people had a black hat to stare at, and nothing more. If this matter were properly attended to, it would make the show much more interesting to all, and a hundred times as pleasant. When we arrived at half-past ten the judges had commenced with the weight-carrying hunters, a class with fifty-two entries, amongst which were some first-rate horses, and some old stagers who have appeared before the bench at many a show, both in town and the provinces. Among the latter was Beechwood, a horse we always set our faces against, and to whom no end of prizes have been awarded; but now in his prime at seven years old, he is passed over, and we will ask any one, does he look like a hunter, or could he ever have done so? Then there was Sprig of Nobility, well known within the arena, and whom we have often described as a very fine gentlemanly-looking horse, but rather a scratchy goer in all his paces. This was observable at York last year, where there was plenty of room, and the more he performed the less he was liked; but here he gained the first place. Then there was Steam Plough, who made his first appearance at Worcester a few years back, and who has been carrying his owner regularly, Mr. Ruck of Cricklade, who pulls down eighteen stone with the saddle. This makes Steam Plough a weight-carrier and no mistake, but we fancy it must be at a miserable pace. Another was Buffon, who came out at Doncaster, and has thickened into a grand horse, but the load at the point of his shoulder spoils him. Then Master of Arts, although but a young one, is well known in the ring, and if greatly improved still lacks breed, and there is a stiffness about him forward that makes us fancy he would ride like a wooden one. The second prize horse, Little John, is full of hunting character, deep, low wiry, and well put together, but a trifle short in the quarter, and with fifteen stone on his back we should think he would have quite as much as he could do, or a little more, with anything like a pace. Priest, a dark grey, five-year-old, is a fair-shaped horse, with very big feet, and his getting a place astonished many. Of the others which most struck us as hunters were Mr. H. Powell's (Market Harborough) Bromley, a rare stamp, that looked like a fifteen-stone hunter and going, with nothing flash about him; his brown horse Lion was another useful slashing-looking horse, and a grand fencer; but faulty in his back ribs. Mr. Maddock's (Surbiton) Sambo is a nice showy corky-going horse with plenty of blood, but not quite perfect in his shoulders. Messrs. Crisp's (Northumberland) Hobgoblin, is abeautifully-made nag, with a deal of style. Mr. Baker's (Clapham Common) Irish Boy was one of the good old-fashioned hunters that an Oxford livery-stable-keeper might make a fortune out of in letting out to the "heavies", as he looked like pounding away for ever, and we doubt if he could go fast enough to tire himself. Mr. Newton's Yorkshire Lad was very deep in his ribs; but looked as slow as a top, and not what he was said to be—thoroughbred. Mr. G. Robson (Easingwold, Yorkshire) has a hunter in Ex-President, and Mr. W. Blewitt (Watford) a good-looking one in Colonel. There were some others worthy of note but we could not catch their numbers. For hunters without condition to weight, with an entry of forty-five, and a great many very middling ones among them, Brayfield came off victorious—a lengthy, deep, well-made horse, up to about 12 stone; the second being Gold Finder, a good-looking bloodlike horse, with a very handsome forehand, rather ragged about the loin and hips, but a slashing goer, and quite worthy of his place; Springy Jack, the third, with a good middle and limbs, has rather too light a neck for his Blacklock head. Mr. Reeve's (Bury) Miss Moody is a neat little mare; and Mr. A. D. Murruta (Kensington Palace Gardens) had two very good-looking ones. Master of Arts was shown in this class, and again passed unnoticed. Mr. Smith, of Dunchurch, had a nice one in Empress; Mr. Foster's (Stourbridge) Saucy Boy was deep, compact, with good ends; Mr. Bray's (Romford) Brunswick, a neat one, with his legs well under him; Mr. Tollit's (Streatham) Northern Light, a good-framed horse, up to weight; Mr. A. Williamson's (Edinburgh) Bonnington, lengthy, on a short leg; Mr. Charles Simmonds' (Oxford) Emperor, of a very good stamp; and Mr. Sutton's (Darlington) Vanguard is a neat little hunter to look at. For hunters not exceeding fifteen-two, without condition to weight, the first prize, Countess, is a clever little hack, slack in her back-ribs; the second prize, Hawk, a yellow chesnut, a stout little horse, up to weight, with hunting character, a fine goer and fencer, but a trifling waspish in his middle; Othello, the third prize, is leggy, and of no character; Mr. A. Barker's Hatfield Doncaster), Marguerite being worth half-a-dozen of him, as far as shape; but Marguerite would not notice the hurdles, and the judges returned the compliment; if as we fancy it was more the fault of the man "in boots, if possible," after all, than of the mare. But this jumping business was more of an absurdity than ever, and the very officials blushed at such an exhibition. With an entry of nineteen in the four-year-old hunter class, Black Tom was again victorious—a prize-taker at Birmingham, York, and other places. He has rather improved in his action; but as at York, he seemed to draw his hind-legs after him, and there is a charger style about him, with a thickness about the throat, and an evil look in the eye, that we don't admire. The second-prize horse, Rugby, is good-looking, barring a slackness in his back. Mr. G. Maskeleyne, of Farringdon, had a neat, compact hunter in Leviathan; but the best of the others were anything but perfect. The Dean, a dark-brown cob of great character and good action that many an elderly gentleman would like to get hold of at something under the price put on him—300 guineas—trotted off with the first prize at his ease, the second being taken by a good goer up to weight; there were seventeen other entries, with one or two good-looking ones amongst them. The best of the weight carrying park hacks was Stamford, a fine deep-topped horse, with good ends and capital action; the second, Greyleg, very neat and compact, with plenty of blood and power, who bent his knee, and was no doubt sure, but very slow. Brunette, who stood third on list, is lengthy and low, up to weight, but spoilt by a vulgar head. Miss Henrietta Turner's (Godstone) "Spoilt Child," who was a great deal the cut of "Greyleg," but lighter in frame and colour, and a capital stepper came in for a commendation and a bit of green riband. Deer Stalker, at the head of the poll for park hacks and ladies' horses over 15-1, is quite a light-weight ladies' horse, very pretty, and a fine mover; but without some dear wished particularly to try the strength of her neck we would not advise her to trust his groggy-looking fore-legs. Mr. Holmes, his owner, had another in this class, "Kingston," a flat-catching looking chesnut, with a light mane and tail, and with some of the characteristics of "a holiday charger," but not any of standing rough work or knocking about; in fact, they were both toys. Sultana, said to be an "accomplished huntress," a kind of Diana who plays on the piano we suppose, was but a vulgar-looking one after all, though placed third. For those not exceeding 15-1, Beauty was first, a neat horse with frightfully artificial action, who went as if troubled with string-halt all round; the second, Bridesmaid, was neat, and the third, Violet, up to weight, with a strong harness shoulders and hammering action. Mr. Smith, of Dunchurch, had a very neat one in Princess, a dun, that should have been noticed; and there were some others very good looking. Of those not exceeding 14½ hands, Pinwire has good looks, not improved by a heavy shoulder; Unique, a thick, lengthy, good-looking cob, and a capital goer; Black Bess clever and well made; while Captain Barlow's Piccadilly, a neat, gentlemanly little hack, and a stylish mover, was much admired, and there were some others worthy of note. The ponies under 12½ hands were fairly represented, the judges going for power; Lord Gifford's Merlin being one of the neatest for a lad. The thoroughbred stallions were about as poor a class as ever entered a ring for a prize, with the exception of the winner, False Alarm, who is very gay, taking horse, with lots of bone, and only wanting another year just to drop to his leg, to make a really nice one. The second, Beckhampton, is short, thick, and lumpy, with frightful buck shins, in fact an overtopped horse altogether. The only others worth a word were Newchurch, a lengthy, low horse, but who would want pulling to pieces and remodelling to make anything of him; and Pluto, a very neat horse, but heavy at his shoulder point. The roadster stallions were well represented, the winner being Quicksilver Shales, a very neat, compact, good goer; and Sportsman, a thick, useful sort of cob, that a little more blood would vastly improve. Shepherd F. Knapp is a good-shaped horse, and wonderful goer, spoiled by a big Roman head, and heavy neck. The first prize was withheld in the hack-stallions under 15 hands. The judges then adjourned till the Monday, when the harness horses were "judged."

PRIZE LIST.

HUNTERS.

JUDGES.—Lord Portsmouth, Lord Suffield, and Captain Percy Williams (and for thorough-bred Stallions).

Weight-carriers, up to 15 stone.—First prize, of £100, to Major Stapylton, Myton Hall, Yorkshire (Sprig of Nobility); second, of £40, to Mr. Joseph Gilman, Birmingham (Little John); third, of £20, to Mr. H. W. Deacon, Ropley (Priest).

Without condition as to weight.—First prize, of £50, to Mr. H. Sanders, Brampton, Northampton (Brayfield); second, of £25, to Mr. H. S. Lucy, Charlcote, Warwick (Goldfinder); third, of £15, to Mr. W. De Winton, Glasbury, Hereford (Springy Jack).

Without conditions as to weight, and not exceeding 15 hands 2 inches high.—First prize, of £40, to Mr. J. Morrison, Newton Mearns, Glasgow (Countess); second, of £20, to Mr. H. Beck, Harperley, Brandon (Hawk); third, of £10, to Mr. R. J. Moss, Wellington (Othello).

FOUR-YEAR-OLDS.—First prize, of £50, to Mr. T. Gee, Wadhurst (Tom); second, of £25, to Mr. J. Topham, Welford (Rugby).

COVER HACKS AND ROADSTERS.

JUDGES.—Colonel Maude, Colonel Kingscote, Sir John Trollope, Sir Geo. Wombwell, Mr. Harvey Farquhar, Lord Combermere, Captain Percy Williams, Mr. W. Williamson, &c., &c.

Not exceeding 15 hands 1 inch high.—First prize, of £15, The Earl of Rosslyn, Dunmow, Essex (The Dean); second, of £10, Mr. H. Martin, Ely, Cambridge (chesnut gelding); third, of £5, to Mr. T. Daniel Hill, Piccadilly (Bismarck).

PARK HACKS.

Weight-carriers, not less than 14 hands 2 inches, not exceeding 15 hands 2 inches high.—First prize, of £20, to Major Stapylton (Stamford); second, of £10, to Mr. T. Johnson, Northallerton (Greyleg); third, of £5, to Mr. J. Webb, Ulceby (Brunette).

Of any height above 15 hands 1 inch high.—First prize, of £20, to Mr. G. Holmes, Beverley (Deerstalker); second, of £10, to Mr. R. Campbell, Army and Navy Club (The Peer); third, of £5, to Mr. A. Barker, Hatfield, Doncaster (Sultana).

Not exceeding 15 hands 1 inch high.—First prize, of £20, to Mr. W. Banks, Gray's Inn Road (Beauty); second, of £10, to Mr. J. D. Lewis, Peterfield, Hants (Bridesmaid); third, of £5, to Mr. J. R. Kirby, Inverness Terrace (Violet).

Not exceeding 14½ hands high.—First prize, of £20, to Mr. W. H. Gaunt, Kirkhammerton, York (Pinwire); second, of £10, to Mr. J. Grout, Woodbridge (Unique).

PONIES.

Not to exceed 12½ hands high, to carry children.—First prize, of £5, to Mr. J. W. Richardson, Willoughton, Lincoln (Uncle Tom); second, of £3, to Mr. W. H. Stone, Dulwich (Billy); third, of £2, to Mr. J. C. Calthorpe, Moultan, Lincoln (Brown).

STALLIONS.

(Thorough-bred.)

First prize, of £40, to Captain Barlow, Hasketon, Woodbridge (False Alarm); second, of £20, to Mr. J. B. Starkey, Faringdon (Beckhampton).

ROADSTERS.

Not less than 15 hands high, for getting Roadsters or Hacks.—First prize, of £20, to Mr. J. Grout, Woodbridge (Quicksilver Shields); second, of £15, to Mr. J. Grout (Sportsman); third, of £5, to Mr. J. Edwards, Ealing, Middlesex (Shepherd F. Knapp).

HACKS.

Under 15 hands, for getting Hacks.—First prize, of £15, *withheld*; second, of £10, to Mr. F. Ferguson, Beverley (Arab Brown); third, of £5, to Mr. J. D. Lewis, Petersfield, Hants (Golden President).

HARNESS HORSES.

JUDGES.—Mr. Harvey Farquhar, Colonel Kingscote, and Sir George Wombwell.

Not exceeding 15 hands 2 inches.—First prize, of £15, to Mr. J. K. Kirby, Inverness Terrace (Violet); second, of £10, to Captain Spiers, M.P., Eaton Square (Beauty); extra prize to Mr. T. Bradfield, Bishops Stortford (by Milo).

Ponies not exceeding 14 hands.—First prize, of £10, to Mr. T. Wilson, Enfield (Polly); second, of £10, to Mr. W. Burton, Mary-le-bone (Camperdown Lass); third, of £5, to Captain Spiers (Dot); commended, Mr. P. Potter, Ixworth, Bury St. Edmunds (Pea Blossom).

Ponies not exceeding 13 hands.—First prize, of £10, to Mr. W. F. Pilcher, Russell Square (Pink); second, of £5, to Mr. T. W. Richardson, Willoughton, Lincoln (Uncle Tom); extra prize to Mr. L. Myers, Middleton Square (Ruby).

Harness Horses driven in pairs.—Prize to Captain Spiers (Beauty and Raven).

A VICTIM TO THE OVER-PRESERVATION OF GAME.—A correspondent of the *Reading Mercury* tells the following sad tale:—"I took a farm of about 500 acres, in Hampshire, in 1859, on lease, with a promise that no game kept should interfere with a tenant. There was none at that time which any farmer need complain of. I had just left a farm where I had taken £400 premium, and I took off it what live and dead stock I thought proper. Nevertheless, my valuation came to over £4,000. Some time after, when I had the farm well stocked, a part of the estate was re-let to a gentleman, whose business was in town, with the lands and woods to sport over: the gentleman to build a house as his residence on the farm (as it was reported at the time) to cost a certain sum, he to pay a rental for twenty-one years; after that term the residence to become the property of the landlord. As the object appeared to be the sale of game as well as sport, then there ensued the destruction of cats and the poisoning of dogs, the trapping of foxes, and, of course, the increase of rabbits and hares to an extent to destroy everything near the covers. I put in eighty acres of wheat, which were eaten to the ground the whole of the winter, and in the spring became a mass of weeds. What was cut of the eighty acres was taken together at harvest in the corner of a field, and put through a machine; we got 58 quarters 2 bushels —a little under 6 bushels per acre. The same season, the men mowed seventy-eight acres of clover, the rick made from which measured eighteen tons: everything on the farm suffered in proportion. Of course, a great deal was said about it, and my landlord told me no rent could be paid. Promises were made; but, in truth, my landlord had no power. After a time I was allowed to leave, if I could get a person to take the farm, which advice I was foolish enough to follow, which took three more years to accomplish. In the meantime, to keep the farm in cultivation, I got myself and kind friends into extreme difficulties, and became considerably back with rent. Then was shown the sympathy of my landlord towards me. He took the produce of the farm, sold it, also the live and dead stock, and left me destitute. I applied to him, representing that I was, with my wife and family, ruined through him, and I hoped, at the final settlement, he would be paid in full; that, as I had all the expenses and loss, he would make me some little deduction. That letter he never answered; and I sent a copy of it to his solicitor, desiring him to lay it before him. I have his answer before me. At the end of the letter he says: "Your landlord considers himself justified in what is done; and he considers that he has been the injured party by your occupation of the farm, having to re-let it at a reduced rental. He therefore declines to make any abatement." These are facts, and I am prepared to prove them.

THE GANG SYSTEM.—Mr. J. A. Clarke, the Secretary of the Central Chamber of Agriculture, has addressed the following letter to one of the local chambers: "It is quite certain that before long, legislation will attempt to prevent women, under a certain age, say eighteen, from working in the fields, and to prevent girls and boys or men from working together. The Earl of Shaftesbury has given notice that he will introduce a Bill on the subject. The objection brought against women working in the fields, is of course derived from the moral mischief officially reported upon, as accruing from the system of 'field-gangs.' I do not know of any legal instructions at present existing with respect to women and children in agricultural labour. At present, no specific proposal is before the public: we are waiting for Earl Shaftesbury's Bill. Meanwhile, the Chambers can say how far they are willing to admit the principles of the Factory Acts to be applied to farm-labourers. The public will certainly demand that something shall be done to improve the education and to prevent the demoralization of young people in agricultural districts." At a meeting of the Hungerford Farmers' Club, on Wednesday, the general opinion appeared to be that no excessive immorality was associated with the gang-system, and that to put a stop to such work would be a very serious matter for agriculturists. The following resolution was, however, put and carried: "That it is the opinion of this Club that all parents should be required by law to have their children taught to read, unless by physical or mental infirmity they were incapacitated from receiving such instruction."

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

With the exception of a few warm and genial days, the weather of the month has been very severe in nearly all parts of the United Kingdom. Snow has fallen in several counties, and vegetation generally has suffered severely. Although not very forward, considerable damage has been sustained by the fruit crops, whilst beans and peas have received a severe check. We understand, however, that the wheats, though the frosts have had the effect of producing a yellow tint in various localities, have not suffered much from the rapid changes in the temperature.

The stocks of wheat now in the hands of the growers are considerably reduced. Very few samples have, therefore, been brought forward in any of the markets, and the trade has continued in a most unsatisfactory state. The fluctuations in prices have been trifling; yet the bulk of the wheat disposed of has been composed of foreign qualities, which have come freely to hand. Apparently, there is very little room for a further upward movement in the quotations; but, of course, everything now depends upon the progress and appearance of the crops during the next two months.

There has been a fair sale for both English and foreign barley, and the quotations have continued steady. The supply of home-grown barley is almost wholly exhausted. The sale for malt has been heavy, on rather lower terms. Large transactions have taken place in foreign oats, on rather easier terms. Both beans and peas have tended upwards in value, from want of supply. Very few changes have taken place in the value of either English or foreign flour.

The quantity of grass in the pastures is seasonably large, and a full average hay crop is pretty generally anticipated. There is still some quantity of last year's hay in stack. Meadow hay has sold at from £3 to £4 5s., clover £4 to £5 10s., and straw £2 to £2 6s. per load.

The imports of colonial wool having been enormous, a large supply is now being offered at public sale in the Metropolis. Hitherto the biddings have been inactive, and the quotations, compared with the March series, have given way 1d. to 2d. per lb. English wool has been drooping in price, with a heavy inquiry. Several parcels of colonial wool have been taken for shipment to France and Belgium, yet foreign purchases have failed to give support to prices.

The supplies of potatoes coastwise and by railway have been tolerably good. The trade has been far from active; nevertheless, prices have ranged from 100s. to 175s. per ton.

The hop bine appears to have suffered somewhat from the severe weather, and it is apprehended that the present year's growth of hops will be only moderate. The trade, therefore, has shown more firmness, but without leading to any decided improvement in the quotations. The imports of foreign hops have fallen off considerably.

There has been very little business doing in any kind of produce in the Scotch markets, yet prices generally have been firm. Very few shipments have been made to the south.

In Ireland, wheat and most other articles have moved off heavily, at about previous rates. Spring corn has changed hands to a fair extent, at full prices.

It is as yet too early to write positively about the potato crop, but we apprehend that it will not be quite equal to last season.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Increased supplies of both English and foreign beasts having been brought forward in the Metropolitan Cattle Market, the demand for most breeds has been far from active, at prices fully equal to the previous month. The stock, especially from Norfolk and Scotland, has made its appearance in really prime condition. The supply from Ireland has wholly declined, owing, we presume, to the more remunerative prices obtained in the Liverpool, Manchester, and Birmingham markets.

The arrivals of sheep having considerably increased, both as to number and quality, the mutton trade has been somewhat heavy, at depressed currencies. The leading quotations for the best Downs and half-breds, out of the wool, has been 5s. to 5s. 2d. per 8 lbs.

In the early part of the month there was a good demand for lambs, at from 7s. to 8s. per 8 lbs. Since then, however, sales have progressed slowly, at drooping prices.

Calves have gradually declined in price, although the number brought forward has not increased to any extent.

There has been a fair sale for really prime pigs, on rather higher terms; but large hogs have met a heavy inquiry.

The total supplies of stock brought forward have been as follows:—

	Head.
Beasts	19,860
Sheep and lambs	160,370
Calves	1,709
Pigs	2,260

COMPARISON OF SUPPLIES.

May.	Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1866	16,275	—	125,490	695	2,195
1865	22,030	475	129,140	3,199	2,117
1864	23,240	534	122,210	2,062	3,080
1863	20,444	538	126,040	2,129	3,120
1862	19,273	510	132,450	1,527	3,022
1861	19,500	500	113,750	1,178	2,950
1860	19,040	543	124,580	2,059	2,920
1859	17,980	482	113,512	1,012	2,260
1858	18,722	480	115,886	1,671	2,760
1857	18,741	450	104,990	1,415	2,530
1856	18,722	495	119,640	1,260	2,545
1855	19,847	410	113,600	2,470	2,590
1854	20,831	576	124,824	2,146	2,435

The comparison of the arrivals of English and Scotch beasts stands thus:—

From—	May. 1865.	May. 1866.	May. 1867.
Norfolk, Suffolk, &c.	9,000	4,620	7,460
Other parts of England	2,950	1,900	2,600
Scotland	3,465	774	950
Ireland................................	330	170	—

The imports of foreign stock into London have been—

	Head.
Beasts	7,915
Sheep and lambs	44,012
Calves	1,303
Pigs	255
Total	53,485
Total in May, 1866	43,930
,, 1865	40,729
,, 1864	28,832
,, 1863	22,161
,, 1862	11,206
,, 1861	18,978
,, 1860	18,910
,, 1859	10,713
,, 1858	6,703
,, 1857	7,243
,, 1856	3,556
,, 1855	7,103
,, 1854	4,703
,, 1853	13,007
,, 1852	8,506

Beef has sold at from 3s. 4d. to 5s. 2d.; mutton, 3s. 6d. to 5s. 2d.; lamb, 6s. 6d. to 8s.; veal, 4s. 4d. to 6s.; pork, 3s. to 4s. 4d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	May, 1863.					May, 1864.				
	s.	d.		s.	d.	s.	d.		s.	d.
Beef from............	3	4	to	5	0	3	4	to	5	0
Mutton...............	3	6	to	4	10	3	8	to	5	4
Lamb	5	4	to	7	4	6	4	to	7	8
Veal..................	4	0	to	5	0	4	2	to	5	4
Pork..................	3	4	to	4	6	3	6	to	4	6
	May, 1865.					May, 1866.				
	s.	d.		s.	d.	s.	d.		s.	d.
Beef from............	3	4	to	5	0	3	10	to	5	2
Mutton...............	4	2	to	6	4	4	4	to	6	0
Lamb	6	8	to	7	8	6	8	to	9	0
Veal..................	4	2	to	5	2	5	4	to	6	4
Pork..................	3	6	to	4	10	4	0	to	5	0

Considerable fluctuations have taken place in the value of meat in Newgate and Leadenhall. Beef closed at from 3s. 4d. to 4s. 10d., mutton 3s. 6d. to 5s., lamb 5s. 4d. to 6s. 4d., veal 3s. 8d. to 5s. 4d., pork 3s. 4d. to 4s. 6d. per 8lbs. by the carcase.

SOUTH WILTSHIRE.

After two of the most ungenial months (for March and April) within the memory of man, May set in with summer-like weather, pushing vegetation forward rapidly; but this was of short duration, we having had a return of northern and easterly winds; and to-day (23rd) it is bitterly cold, the frost last night having, in some of the low, damp localities, cut down many of the forward potatoes. Much barley, on the heavy lands, has been sown very late, and is now only just coming up. On the hills many oats, peas, and some barley were sown in February; and in bean districts some quantity of this corn was also planted early. March was favourable for sowing till the 12th. Then we had snow, frost, and rough, winterly weather, putting a stop to all field-work till the 29th, when the weather again broke up, and the bulk of our barley went in well. The early spring corn all seems to be doing well; but the wheat crop is very irregular, and does not promise a heavy crop at present. Many pieces are very patchy, having some very good wheat and some very thin; whilst others have plant enough, but look very weakly: and the cold weather we have had must cause the harvest of this year to be far from an early one. The clover and young grasses have very much deteriorated of late. Our crop of lambs is below an average, nearly every farmer having a short number, whilst many of those we have are stunted in their growth, in consequence of the rough weather in March and also in April. We do not think many were lost, precautions being taken in our exposed districts; but, as a general rule, twins were very scarce this year. Sheep have receded in price something like 10s. per head since last year at this time, tegs making very little, if any, more money now than in October last. The heavy hay crop made last summer is nearly all consumed; but sheep-keep is plentiful at present. Our corn markets have been dull the past week, with a slightly-downward tendency. Pigs are very cheap, both stores and fat ones, the latter making only 9s. per score.—May 23.

SOUTH LINCOLNSHIRE.

What variable weather! On the 6th of May and two following days it was not merely warm—it was hot: the grazing fields in consequence soon put on the most pleasing appearance we have seen for years; grass became abundant, and for the best welfare of sheep grew too fast; many weak animals were soon affected with diarrhœa, and this astonishingly cold weather has added more unfavourable symptoms to the attack, but it has not degenerated into dysentery. This is so far satisfactory; but the grass is so cold, and continually wet, that many fears are entertained as to the progress of the disorder. Cotton-cake is resorted to in a liberal spirit, and with good result. Upon the whole the grazing department is unsatisfactory; our fields carry abundance of stock, but there is but little nutritive value in the grass. Our sheep fairs and markets for woolled sheep are nearly over, and the price has been somewhat in favour of the seller from the commencement. The show of sheep both in numbers and quality has been above an average one, prices about 20s. per head under last year. Cattle shows and fairs are not yet permitted in this district, but what are bought-in are at considerably higher rates relatively than sheep, hence many graziers are purchasing sheep, which accounts for the continued demand. Pigs were never so cheap in proportion to other stock; ten weeks old weanlings at from 6s. to 7s. each, large stores at from 25s. to 30s. each: pig feed is exceedingly scarce, no mangolds left, and potato chats at 10s. the sack. Our stock of potatoes is nearly exhausted, and nearly all has recently been sent to London salesmen. This "large arrival" has slightly depressed the sale, but such cold weather must cause a reaction, because it so materially retards the growth of other roots and esculents. We have a large breadth of potatoes under crop: many are up, and happily still look well. Mangolds come up "wretchedly bad." The first sowings cannot yield a good crop. Those now going in present a better prospect. Last year's seed is not to be depended upon with much confidence, so a very profuse seeding is given—*i. e.*, from six to twelve pounds per acre on ridges. Preparations are generally making for swedes, but I have not seen any put in yet. The first and second weeks in June is the favourite time here. Our corn crops up to the present time have been improving greatly; but now a check is to be observed in very many fields. The tremendous thunder-storms of the past two weeks made the land very wet, and the cold season and severe hailstorms of the past few days have together done injury, in some cases very serious damage—in one instance to the necessity of ploughing-up the crop of peas. The turnip-seed crops have also sustained injury. These storms also caused a suspension of nearly all field operations for a few days, so that thrashing was made to fill up the interval, and has in consequence led to a somewhat larger show of wheat in our local markets. The supply, however, is a very short one; we never knew the district to be so bare of corn stacks. We are pleased to notice a better feeling in our leading wool-markets. Nothing is doing here at present. Our wool-buyers, who are chiefly Yorkshire wool-staplers, are visiting our local markets, making inquiries, which looks encouraging. We anticipate a fair trade, at remunerative prices. All-hogg from 40s. to 46s., mixed lots from 38s. to 42s. This can be afforded, and will, we believe, be given freely.—May 23rd.

THE NORTH-EAST OF SCOTLAND.

A winter of unusual severity has been followed by a spring the most untoward, not to say disastrous, that has been experienced in this part of the country for at least half a century. Sowing was commenced about the beginning of April, and a few fields of dry land were at that period sown in tolerable condition; but the weather speedily became exceedingly wet, and has continued so ever since. The opportunity of a partially dry day now and then was seized to commit portions of the seed to the ground; but the soil was never in good condition for the operation of the harrow. Nevertheless, as the season advanced, a necessity was laid upon us to put the seed into the ground under any circumstances; but the almost incessant rain (relieved only by occasional days of fog from the German Ocean) rendered it impossible to get the harrowing-in of the seed completed; and, in many fields, it never was completed. No one is found who can say that he ever saw the seed committed to the ground under circumstances so unfavourable. On wet-lying fields and on clay land, sowing was delayed under the hope of better weather—which never came; and, consequently, a large portion of the crop must be late. Altogether, therefore, our prospects of a good crop are anything but favourable. The scarcity of fodder (alluded to in our last) has been severely felt by many. The supply of turnips also ultimately fell short in many cases; but the deficiency of these was by no means so general as that of straw. It has been generally found necessary to turn the cattle afield before the grass had made much progress, and the consequence is that pasture-fields are at this date almost everywhere eaten very bare. This scarcity of grass has been greatly increased by the large number of sheep at present in the county. The high prices of mutton and wool during late years have induced almost every farmer to keep a score or two of sheep—at least during the winter; and the inroads which these have made on the pasture-grass (which had wont to be reserved for cattle alone) have been felt as a considerable inconvenience this season. Sheep are, moreover, quite at a discount in our markets at present, and are selling at a reduction of 25 per cent. upon the prices which they brought the last two years. The sale of fat cattle has also been very depressed for some weeks past. For grazing stock there is a fair demand. Grain has sold at very fair prices during the winter; and at this date it has reached a figure which, two years ago, few ever expected to see it attain. A considerable portion of the potatoes have rotted in the "pits," and they are therefore scarce and high in price. Rain and snow have fallen since the 1st of January to the enormous depth (for the east coast of our island) of 20·93, or nearly 21 inches—of which amount no less than 11 inches fell in January, and 4½ inches last month. The soil is still super-saturated with moisture, and the preparation of turnip-land goes on under every disadvantage. A general commencement of turnip-sowing will be made this week—if the weather will at all permit.—May 20.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ASHBOURN FAIR.—There were a few store sheep, which commanded a better price than of late, also a few fat sheep, which sold at 6½d. to 7d. per lb. The show of horses was very limited.

ASHBURTON MONTHLY MARKET.—There was an excellent supply of fat and store cattle and sheep, most of which fetched good priees, prime steers fetching almost any figure. A large supply of cows and calves in excellent condition, and in good demand, prices varying from £14 to £20. About 100 head of bullocks were driven in, most of which changed hands. Fat lambs sold well at 23s. each. Some very fine horses were also shown. Beef from 7d. to 8d., mutton from 7d. to 8d., pork 6d. to 7d., veal 7d. to 7½d., lamb 9d. per lb.

BOSTON SHEEP MARKET.—A fair supply of fat sheep, which met with a brisk demand at from 6½d. to 7d. per lb. A good show of hoggs, with prices about the same as last week, or a shade better.

DUNSTABLE FAIR.—Of store and fat sheep there was a fine show, and the prices realised were good. Store, Down, and long-wool tegs, 40s. to 50s. each; ewes, 50s. to 55s.; lambs, from 25s. to 30s.; fat wethers, 5s. to 5s. 4d. per 8lbs.; in their wool, from 5s. 6d. to 5s. 8d.; longwool sheep, from 4s. 10d. to 5s.; fat lambs, from 7s. 4d. to 7s. 8d. There were some good nags and driving horses, and a great many cart horses, for which high prices were given. Best three to four years old sold at from 40 to 50 guineas each; inferior, 30 to 35 guineas; cart horses, 30 to 45 guineas.

ILSLEY MONTHLY MARKET.—There was a large supply of sheep. The trade showed considerable improvement. Prices were 1s. to 2s. per head in advance of those of last market. Ewes made 48s. to 61s., lambs from 26s. to 34s., pigs 40s. to 52s. the head.

IPSWICH FAIR.—The show of sheep was not quite equal to some years. There was a little revival in trade, but buyers were still by no means eager, and, on the whole, business must be said to be depressed, except for first-rate hoggets. There were some good hoggets shown, and prices ranged from 38s. to 54s., in the wool; fat sheep were sold at 8s. 6d. to 9s. per 14lbs. Lambs brought as good prices as anything, and varied from 18s. to 28s.

KNIGHTON MONTHLY MARKET.—There was a fair show of stock. Cows and calves were in good demand, and made good prices; lean stock and good barrens were sought after, and most on offer changed hands at rising rates. Few horses in the market, and little business doing in them. Small store pigs found buyers at rather better prices than last market.

MORETONHAMPSTEAD GREAT MARKET. — The show of bullocks was much larger than usual: fat bullocks, cows and calves, steers, heifers, &c., were of excellent quality, and fetched fair prices with a quick sale. There were upwards of 150 bullocks, most of which were sold. The show of sheep and lambs was rather small; the principal part were also sold.

NEWARK FAT STOCK MARKET.—There was a fair supply of Sheep, and prices were a trifle in advance. Mutton, 6½d. and 7d. per lb.; beef, 8s. 6d. and 9s. per stone.

OSWESTRY FAIR.—There was a tolerably good show of sheep, lambs, and pigs. Quotations are for mutton 7½d. to 8½d., and lamb 9½d. to 10d.

STRANRAER MONTHLY MARKET.—Very few good cattle were exhibited, and upon the whole the demand was slack, with prices having a downward tendency. Two-year-old Galloways were sold at £10 5s. per head, with the consideration that a luckpenny would be returned. Black stirks were selling at all prices from £2 10s. up to £5 10s. each. Different lots of the Ayrshire breed changed hands at prices varying according to age and size. It is evident that the Ayrshire stock is fast driving the Galloways and black half-breds out of our markets, dairy produce having been paying best of late years.

TOLLER DOWN FAIR was largely attended, and the number of sheep penned was up to the usual average. Trade, however, opened dull, and buyers refused to give the prices asked. Towards the close the majority of the sheep changed hands at about 3s. per head reduction upon previous fairs. Old ewes sold from 43s. to 49s.; hoggs, 40s. to 46s.; and wether lambs from 20s. to 28s. per head.

IRISH FAIRS.—DUNDALK: The article most in request, finished beef, was in scant supply, owing no doubt to the fact that the late season's stock of fat cattle in this district is exhausted, and it is as yet too soon for the new grass-fed supply. The lots, however, exhibited in this department were of prime quality, and sold at a shade over last quotations, say 6½d. to 7½d. per lb., and ranging on the average from 63s. to 66s. per cwt. Good store cattle were in brisk demand, all of good quality realizing remunerative prices; but the greater portion on show was not sufficiently attractive to dealers or graziers to give high prices, and holders being firm, a large number were brought home unsold. Springers of good quality were much sought for, and brought high prices, one realizing £25. Heifers, three-year-olds, brought from £12 to £15, two-year-olds £8 to £12, and yearlings from £4 10s. to £6. The supply of sheep was limited, but this was balanced by a good supply of lambs. The prices of sheep ranged from 55s. to 43s. each; lambs from 36s. to 27s. 6d. Mutton may be said to have brought in wool 9d. per lb., in sink 6½d. to 7½d. The supply of pigs was large, but, from the little demand, experienced a decided fall, as compared with late rates. Bacon pigs did not realize more than 40s. per cwt., porkers 45s. per ditto. There was a great increase in the show of horses.—CAMLOUGH (COUNTY ARMAGH): Milch cows were in fair supply, and there was a fair business done amongst the jobbers. The cattle were principally aged, and prices were consequently not so high. Springers may be quoted from £8 to £15 each, average price £12 each. Three or four superior ones went as high as £17 to £18 10s. each. Strippers were also in good supply, and several excellent ones were disposed of at £8 to £12 10s. per head; three-year-old stores ruled from £13 10s. to £17, two-year-olds from £8 10s. to £13, one-year-olds from £4 to £8, according to merit. English buyers invested very liberally in young bullocks, which advanced fully £1 per head beyond the prices obtained at the April fair. There was an average supply of sheep for the season. Fat sheep, however, appeared to be "few and far between," if we except one or two good lots bought up early for the export trade, from 60s. to 70s. each. Lambs were sold pretty freely from 18s. to 28s., and 30s. each. In the pigs we observed several fat ones, but the demand did not appear to be equal to the supply. Bacon may be quoted at 8s. 6d. per score. Stores and bonnives were cheaper than last fair. The show of horses was pretty fair, and a considerable number of young animals were disposed of at tolerably good prices, say from £15 to £20 each, principally for agricultural purposes.—Dromagh: The show of cattle exhibited at this fair was very large. The milch cattle department was well supplied, demand dull, highest price £10 10s. Strippers were in fair demand at from £5 to £10. The demand for springers was very brisk at from £7 10s. to £12. The sheep market was crowded to excess, mutton limited in supply. Store sheep without wool were sold at from 15s. to £1 4s. Stock sheep realized £1 to £2 4s. a piece. Store lambs, which were numerons, went at 6s. and 18s. a head. Fat lambs from 15s. to 26s.—Castlepollard: There was a large fair, and a great deal of business done, at the following rates: Three-year-old stores £13 to £17, two-year-old £9 to £13, one-year-old £5 10s. to £6 5s., dry cows £9 to £15, milkers and springers £10 to £20 per head. Beef cattle were scarce, and worth from £17 to £22 each. Fat wedders 56s. to 66s., ewes 50s. to 58s., lambs 24s. to 27s., hoggets in wool 40s. to 48s. for best. Pigs hardly saleable, at 40s. or 39s. per cwt., stores 30s. to 42s. each, bonhams 18s. to 22s. per pair. Good number of horses, from £10 to £25, but hardly a demand. Navan: The supply of beef was very small, although numerous victuallers were prepared to make heavy investments for home consumption. The fact is, that few dealers in the county have at present any stall-fed cattle available. The price of beef of prime quality was 70s. to 75s. per cwt. in sink. We had an ample show of store cattle. Three-year-old store heifers rated from £14 to £18 10s. each; two-year-olds from £10 to £12 10s. each; yearlings from £4 to £8. One lot of yearlings sold at £8 5s., and another lot of sixty fetched £7 10s. per head. Three-year-old £12 10s. to £16 10s. per head; two-year-olds £9 to £11 10s. each; yearling bullocks £4 to £7. Few lots of stores possessing any merit were left unsold. In the dairy department there was a full average supply. Superior springers and milkers were fully £2 per head higher than the prices obtained at the late fair of Drogheda. Best springers brought £16 10s. to £24 per head, and were all quickly bought up by noted dealers. Milch cows sold from £10 to £17 10s. per head. There was a deterioration in the value of mutton, and lambs also were materially lower than at late fairs. Wethers rated from 60s. to 65s. generally. Mutton (wether) in wool from 8d. to 8½d. per lb.; clipped wethers from 6½d. to 7d. per lb., clipped ewes 5½d. to 6½d.; hoggets from 34s. to 40s. each. The demand for lambs was dull, and the prices were 25s. to 33s. each. In the pig fair there was a considerable supply. Fat pigs were sold from £4 10s. to £6 each; porkers from £2 to £3; bacon about 45s. per cwt. of 112 lbs.; store pigs looking down, and fetched from 35s. to 50s. a-piece; slips and runners 20s. to 27s. 6d. each; suckers and weanlings 8s. to 15s. per head. The horse fair presented a pretty numerous show; the nags were principally those suited for farmers' use, with a fair quota of long tails; best horses in the fair might be quoted from £25 to £40 each; long tails from £20 to £25; agricultural animals and inferior roadsters from £15 to £20 each.

HADLEIGH FARMERS' CLUB.—The annual meeting of this club was held on Friday, May 17, at Hadleigh, Suffolk. The prizes were awarded as follows:—Best brood mare for the general purposes of agriculture, Mr. J. Vince; second, Mr. J. Vince; best gelding, Mr. R. Partridge, Shelby; best gast mare, Mr. T. King, Preston; best colt, under 27 months old, M. W. Wilson, Baylham; best gelding, under 27 months old, Mr. W. Gurdon; best filly, Mr. W. Wilson; best colt or gelding, under 15 months old, Mr. W. Grimwade; best filly, under 15 months old, Mr. W. Grimwade; best foal, Mr. J. Vince; best tup, of the Southdown breed of any age, Mr. T. Partridge; best shearling tup, of long-wool breed, Messrs R. and J. Rand; best tup of long-wool breed of any age, Mr. W. Gurdon; best pen of five black-faced ewe hoggets, Mr. J. G. Stow, Hadleigh, Hamlet; best pen of five long-wool ewe hoggets, of any pure breed, Messrs. R. and J. Rand; best pen of five long-wool wether hoggets of any cross breed, Messrs. R. and J. Rand; best pen of five long-wool ewe hoggets, of any cross breed, Mr. W. Kersey; best pen of ten ewes, of any breed, with their lambs, Mr. W. Kersey; best boar, Mr. W. Kersey; second-best, Mr. J. Vince; best breeding sow, J. Robinsen; second-best, Mr. H. Partridge. At the dinner in the evening, Sir C. Rowley, Bart., presided. In the course of the after-dinner proceedings Mr. Gurdon advocated the establishment of county experimental farms.

THE QUEEN OF THE BEES.—In every hive there are a queen, male bees or drones, and workers, which are of no gender, or rather are undeveloped females. The queen is considerably larger than the drone, and the drone is about as much larger than the working bee. There is never more than one queen in a hive, and if a stranger-queen should happen by accident, or in the indulgence of their curiosity, to enter a hive in which her authority is not recognized, the bees who act as guards at the entrance instantly seize her, and though their respect for royalty is too great to allow of their ill-treating her, they crowd upon her so closely that she cannot escape, and they do not release her until their own queen arrives to do battle in defence of her lawful rights. The conduct of the commonalty under such circumstances is exceedingly remarkable; they could put the intruder to death if they choose, without suffering their own queen to run the risk of being killed, but they do not do so; they act strictly on the principle of fair play; at the same time they will not allow the combatants to separate until the victory is achieved by one of them. The instant their queen makes her appearance, attended by a number of her subjects, those who hold the stranger in custody draw back, and leave a clear space for the encounter. If, as rarely happens, the two sovereigns have no desire to fight, or if they try to run away, the workers seize them, and will on no account allow them to indulge their cowardice; they are never allowed to quit the arena, nor to cease fighting until one is killed. Huber relates several experiments made by him with the view of ascertaining if this conduct of the bees were invariable, and he found that it was; whether the combatants were two queens, both engaged in laying eggs, or a fertile queen and a virgin queen, or two virgin queens. A very singular circumstance in connection with these encounters is, that both manifest the greatest horror of using their stings whenever in the course of the fight they find themselves in a position to kill each other. In such cases they separate, and show no desire to renew the fight; but the spectators lay hold of them, and draw them back into the cleared space, and compel them to face each other again. It is not often, however, that the queen of the hive requires any compulsion to fight. Her jealousy of a rival is of the most intense character; and if two emerge from their cells at the same moment, their first act is to rush at each other and settle by a single combat which is to rule; they will no more consent to a divided jurisdiction than the workers themselves would permit it. In this respect the example of the competitors for the throne might be imitated with advantage to humanity by human competitors; they do not suffer or incite their future subjects to engage in a civil war in support of their respective claims, but decide the question by the simple process of fighting it out in their own persons. There are occasions, however, when the jealousy of the queen has to be restrained in the interest of the community; this is especially the case when a portion of the hive is about to quit it for a separate habitation, in consequence of the increase of their numbers. The emigrants on these occasions are led by the old queen, and a new queen is liberated to take her place in the hive as soon as she departs. But if at the moment the colony is about to emerge the weather becomes overcast, and rain either falls or threatens to fall, the emigration will be delayed, and the constant watchfulness of the guard appointed to protect the young queen is necessary to prevent her mother from putting her to death, and from tearing open the cells containing the royal brood, and killing the occupants. The guards do not treat her with disrespect or unkindness, but they are firm. It is said that she sometimes paralyzes their movements by emitting a low humming sound, precisely as if she were addressing them, and then tries to take advantage of the effect she produces to renew her attempt; but the instant she becomes silent they awake to the sense of their duty, if indeed they have ever forgotten it in listening to her.—*Once a Week*.

TEXTLESS NOTES.

BY A CROTCHETY FARMER.

IN PARIS AND AT ITS EXHIBITION OF 1867.

One would fancy that there could not be an easier task to find a place and to decide upon a style of living better calculated to enable a man to indulge in crotchety notions than Paris and that adopted by the French people. It is just possible, however, that despite the temptation that exists to a man of crotchety habits to be specially crotchety in France and amongst Frenchmen, it may be an easier task withal to find material for crotchetiness amongst ourselves. And this may possibly arise in my own particular case from the habit which is apparently part of my nature of being crotchety; so that if I am not so now it may be precisely because I am or might otherwise be expected to be so. Certain it is, that in many things I will not be found to have the idea that in all things we—that is, the English—are altogether right, while they—that is, the French—are altogether wrong. I am, for instance, so crotchety as to believe, despite the notion which has been for so long and so persistently insisted upon amongst us that Frenchmen are altogether and in every way behind us, that we have in many, or shall I say in a few ?—one or two, or possibly three or four ways—much to learn from them. I have just, or, rather, very recently risen from an excellent dinner, where, from the potage to the cup of coffee, everything has been so good, so appetizing, and so satisfying withal, that I am compelled to admit—albeit my English blood burns within me, with all its prejudices, beliefs, and non-beliefs—that we do not understand cooking. Unsatisfactory remembrances of most unsatisfactory dinners in England rose up before me, where— But it is unnecessary to harrow my own feelings, or those of my readers, by the painful details. How comes it—or, as a Frenchman would say, "How arrives it"—that we are so wretchedly behind in this most essential art—essential in every way? for I confess to being one of those who, in order to live, desire to live well. Is it that our meats are not so good, or our appliances of cooking not so adapted to the end in view as are those of the Frenchman? Again, I ask, how arrives it? But I may ask in vain, and wait in vain for a reply, and come to the conclusion that it is one of those things "which no fellah can understand." I yesterday looked in at what was going on in the interior of the English cottage erected in the park of the Exhibition; and I there discovered the unfinished erection of a cooking stove *à l'Anglaise*, and which was, I confess, as likely to convey as wrong an impression to the foreign visitor who may venture to go within the mysterious enclosure of the walls of a building which must be a mystery in many ways to him, of what our English cottage requires in the way of cooking apparatus, as would many of the incomprehensible fittings, exterior and interior, with which this extraordinary structure abounds. I could not help asking myself, Is this cooking apparatus really designed to illustrate that necessary for a cottage, or that for the cookery of an army? For really, to look at its portentous dimensions, and compare it with what I have seen in a French cuisine, I might well expect it to do work for an army or for an hospital. I might have asked of the workmen busy at this gigantic apparatus; but of course, being Englishmen, I would have got little or no information, and I am crotchety enough to say that had they been French workmen I would have got all the information they could have given me, with a ready politeness, which, to say the least, would have been pleasant. My experience of both leads me to know which I prefer when I wish to ask a question. Truly, French politeness may not be sincere, as many of my countrymen say it is not; nevertheless, seeing I cannot possibly know the mind of the Frenchman who is polite, nor trace his motives for being so, so far as I am concerned it has all the practical advantage of being sincere. I wonder if it is crochety to be charitable, and to believe good things of all men, whether they be of our nation or not? Would we like to be treated as we treat others? I trow, not. To return to my mutton, as the French say—a most appropriate remark surely, when I am on the subject of cooking—I should like very much to see the Committee on Food of the Society of Arts take up the subject of cooking apparatus. I do not say that the general introduction of good cooking stoves amongst us would enable us to cook properly; but they are the means to an end. One suggestive fact is worth noting, at all events. A French cook, with a handful or two of charcoal, will, in his or her stove, cook a dinner for a family. And this is a very important point, and one which bears very closely upon the "food question" of the working population—a question which at no time possessed so much practical importance as it possesses now. I am glad that the whole subject is being taken up by an exceedingly energetic Committee of that energetic body, the Society of Arts; and I trust that they will take advantage, or cause advantage to be taken, of the exceedingly suggestive series of objects exhibited at Paris in connection with the department here alluded, and only alluded, to. But it is not merely in the department of cooking appliances that the French excel us: the contrast between our mode and their mode of managing the kitchen is just as striking when we come to investigate the French mode of treating alimentary substances, to quote the grand scientific phrase, or in plainer style food, including in this term both animal and vegetable substances; and here the contrast is painful—painful, I mean so far as we are concerned. Your columns, Mr. Editor, have more than once been open to communications respecting the evils of "waste" as evidenced in the daily doings of our poorer classes; I need not therefore allude, or do little more than allude, to some of their habits in this respect of bread constantly thrown away, of coals wasted, or of clothes destroyed; this is open and flagrant waste for which no excuse can or should be offered; it is simply the waste which brings want with it, and to those who can so waste we would almost be crotchety enough to say that no charitable hand should bring to them what will mitigate the want resulting from it. But there may be, or at all events I may ask the question, is there any remedy or excuse for the waste which is brought about by not knowing how to treat and use articles of food economically? for that waste—or perhaps, to put it in a less fault-finding or severe way, loss of materials—does result, and to a large extent, from the way our poorer classes use food, is notorious enough. I have heard a Parisian say that a French cook would make a dinner out of the materials wasted by an English one.

Somewhat exaggerated as this doubtless was, and is, there is a vast deal of truth in it nevertheless. To those who do know something (and, without egotism, I may say I am one of those who do know something—not much certainly, but quite enough to enable me to make comparisons) about the French, or rather, I may say, the continental modes generally, of preparing and cooking food, there is little doubt in their minds that a very considerable saving would be effected in the houses of the working-classes if they were adopted in England. I have been often surprised at the toothsome, savoury, and satisfiying dinners—I say, satisfying, for I have partaken of them—made from such small amounts of materials. Of course, I am not crotchety enough to begin here to detail how this is done. I am not writing upon cookery, but only upon some points connected with it which have a very close bearing upon the well-being of our working men. For to work they must eat, and it is no small matter, but in truth a very great one, to consider any mode by which what he has got to eat may go the farthest. Not that I think it would be so very crotchety if I did put down in the pages of my much-loved *Mark-Lane Express* sundry notes which I have been crotchety enough to make abroad upon sundry modes of cooking, at once delectable and economical. Such might not be dignifying work, but it would be useful; not that, after all, useful work is undignifying. The art of dining well has been made the subject of elaborate treatises; and if I could show a poor man how to dine well and at the same time economically, I would be doing the state a service. Every one agrees that he who makes two blades of grass to grow where but one grew before deserves well of his country. Is the sentiment to be less thought of, if it is made to apply to beef or bread, making by one plan one pound of them do as much as two pounds on another plan? But it is not only in view of the methods adopted by the French in economising articles of food that they are deserving of praise if not of imitation; the point is just as worthy of notice and of praise, which refers to their using materials we do not use, and which indeed we would throw away. I have seen an Englishman de lighted with a dish of vegetables, partaken of at a bountiful table, and yet very much surprised to know that it was made of vegetables or parts of vegetables which our cooks, rich and poor, would have sent to the dust-heap—of soup made of scraps, which would have been sent to the pig-pot. These things are worthy of consideration, even by the most scientific reader. Do I say the most scientific reader? Why, he will of all readers be the very man to appreciate the value of such points which suggest such considerations; for who but the scientific man knows so well the value of the utilization of material and the using up of what by some are designated "waste" substances? as if anything is waste. More than one place in this Great Exhibition is filled with materials which will yield much that is valuable in an economical point of view if rightly examined. It remains to be seen whether I shall examine them rightly, or am able to do so; or whether being a crotchety man, I may, just because they are valuable, from this point of view decide not to avail myself of their treasures of suggestiveness. Be this as it may, they are not the less there, and waiting to be examined by some one. And if I do not, may this "one" who may take my place be induced to give the results of his examination to the readers of this Journal: they will be practically valuable; for there is much yet to do, to reform farm-house and cottage housewifery and cookery.

REVIEW OF THE CORN TRADE

DURING THE PAST MONTH.

Of all the changeable months of this most changeable year, the month of May has run wildest in extremes. Before a week had passed, we had an outburst of such steady, tropical heat for about four days, that all nature was set a-panting; when, a seemingly agreeable coolness following, it was heartily welcomed, till the severity of the east wind and intense frosts, up to the 24th, with sleet, snow, and tremendous hail, sweeping not only over the British Isles, but all over France and other countries, gave us an impression that we were under a serious mistake; and the oldest among us has had to task his memory in vain, to go back to such extremes. However, the storms seem at last subsiding into calm, there being soft breezes and abundant rain (quære, if not too much for steady and productive growth?), and we find the white-thorn still blossoming in May, and may yet reap the harvest in August, as in ordinary years. But, should vegetation pass such changes unscathed, it will be a new thing to put upon the record, as one of the marvels of 1867. We have seen many forward pieces of wheat unusually forced; and for such most danger must be feared. We have heard of later pieces blackened by the frost; and if the flag be thus damaged, we hope the ears were too backward to have been nipped themselves; but this will soon be seen, and we shall then learn whether there is a prospect of permanent injury. All this, happening after a small gathering, and stacks fast being used up, is ominous; but let us hope for the best.

Our estimated necessities not yet being met by adequate foreign supplies, we cannot wonder that the month has passed over without any abatement of prices. London has twice fluctuated; but the fluctuations have been very transient and only partial in the country, and universal remarks confirm the previous belief in the near exhaustion of our home resources, not only in wheat, but every other grain. There have been severe local complaints in France from storms, and in Germany from frost; and it is an unusual circumstance that St. Petersburg was frost-bound to the 23rd of May. February, therefore, with its spring-like blandness, was a gay deceiver; and in many places on the Continent the rye, the first and most important crop, has suffered by wet and severe night-frosts. It is well, when angry passions were stirring between France and Prussia, that the Conference issued in peace; for war, with scarcity, would have been war with famine and pestilence, and the whole face of Europe might have changed. Among other countries, France gives the most moderate quotations, on the whole; and the high rates of Germany do not give a prospect of free shipments; while America remains still more unlikely to do anything, and Liverpool has become one of the resources of New York. The following rates were recently quoted at the several places named: White wheat at Paris was 66s. 6d., red 63s., the best white at Bordeaux 65s. 6d. per qr.; red at Bruges 60s., fine ditto at Liege 65s., Zealand at Maestricht 63s., at Rotterdam 66s. 6d., mixed Polish at Amsterdam 69s., Mecklenburgh red at Hamburgh 68s., fine red at Rostock 65s., at Cologne 61s., at Stettin and Frankfort 61s. 6d., highmixed new at Dantzic 69s., Ghirka at Ibrail 50s. per qr.; Canada spring at Kingston 66s. 8d. per 480lbs., No. 2 spring at New York 70s., white Californian 92s. per 480lbs., spring No. 2 at Chicago 68s. 6d. per 480 lbs.

The first Monday in Mark-lane opened on short supplies of English wheat, with a liberal arrival of foreign. There was but a scanty show of samples during the morning from Essex and Kent; but, with the sudden appearance of extremely hot and forcing weather, the trade was very slow, at the currency of the previous Monday. There was very little doing in foreign; but neither the large arrival nor unusually hot weather disposed holders to make offers on lower terms. The value of floating cargoes was without change. The earlier country markets this week were generally firm; and some places in the south were 1s. per qr. higher; but, as the hot weather continued, a great calm was generally the consequence, the heat prevailing giving the idea of the near approach of harvest. Liverpool, by the continuance of a Californian demand, was on Tuesday 1d. to 2d. per cental higher; but this improvement was lost on Friday, and several of the later markets evinced symptoms of weakness. The Scotch markets were taken aback by the forcing sunshine; and several of them noted prices rather in favour of buyers. So did Edinburgh, though Glasgow was unaltered. Dublin found a very quiet state of trade, and so did the Irish markets generally; but there was very little disposition to give way in prices.

On the second Monday the home supplies were limited, but those from the Continent continued abundant. There was a very limited exhibition of samples from Kent and Essex during the morning; and only a portion went off, at the previous currency, though the weather had changed to severely cold. There was but little business in foreign, holders of which not being disposed to force any quantity, ex ship, of the week's supply, so prices were nominally unaltered. Less demand was experienced for cargoes afloat, and prices were scarcely maintained. With the key-note of summer struck in the country on the previous week, farmers evinced less disposition to husband their remaining produce in many places; so that Birmingham, Manchester, Market Rasen, and Newark noted a decline of 1s. per qr.; but, with little to show in several other markets, the tendency in such cases was upwards, as at Croydon, Newbury, Stockton-on-Tees, &c. Hull, Leeds, Liverpool, and Ipswich were unaltered. Glasgow noted a reduction of 1s. per qr., and Edinburgh of 1s. to 2s. per qr. Dublin, though dull, noted no change of value.

On the third Monday there was a slight increase in the home supplies, and a larger one in foreign arrivals, these latter reaching to 50,000 qrs., mostly from Dantzic and other Baltic ports. The cold then had moderated, and the season became more steady. The show from the near counties being short, this circumstance had little influence on millers, who had been large importers on their own account; so home-growth was neglected, and only sold slowly, at a decline of 1s. to 2s. per qr. Foreign also was very dull, though some very fine samples were exhibited, and among them the first arrival from Adelaide, weighing 66lbs. per bushel. Prices therefore gave way 1s. per qr., without much progress being made. Cargoes afloat also were less in demand, though offered at the same decline. There was very little disposition this week to follow the London decline. A few places were cheaper, as Dunstable, Reading, and some other Berkshire markets; but there were contrary symptoms in many places, and it was no uncommon thing for farmers, after millers had tried hard to bring them to Mark-lane terms, quietly to tie up their samples and return home, conscious that the mouths of the many would be less grudging than their usual customers; while several markets realized 1s. per qr. advance. Even at Glasgow, which is often the mere reflex of our metropolitan market, no decline was noted. Leith found a better sale; and Dumfries got the upper hand of buyers. Dublin, with its characteristic quiet, noted no change in the value of any grain but maize, which was 6d. per qr. lower.

The fourth Monday's returns were unusually small, both in English and foreign qualities. Almost nothing appeared from Kent during the morning, and very little from Essex. The weather then, after a good deal of rain, had become genial; yet the scanty show and good reports from the country emboldened English factors to demand high terms, and in the little that was done the previous Monday's decline of 1s. to 2s. per qr. was recovered. There was a good trade in Russian sorts at fully 1s. per qr. advance, and all other foreign were held for the same improvement.

The imports into London for four weeks were 19,004 qrs. English, 144,286 qrs. foreign, against 19,246 qrs. English, 72,894 foreign in 1866. The London averages commenced at 64s. 4d. and closed at 68s. 11d. The general averages, which show a fortnight's previous business, began at 62s. 11d. and finished at 68s. 11d., which corresponded with the upward movement of April. The imports into the kingdom for the four weeks ending 18th May were 2,969,646 cwt. wheat, 314,731 cwt. flour.

The flour trade, on the whole, has been dull, but without quotable change. Town millers on the 29th April (which could not be included in our monthly review) raised their top price to 60s. per sack, and there it has stood ever since. Country sorts on the third Monday gave way about 1s. per sack, as well as foreign; but the last Monday brought more tone to the trade, and prices were rather against buyers. Stocks of foreign are light, and country samples by no means heavy; so any upward movement in wheat would be very speedily felt. The best Norfolk have been worth about 46s., French and Spanish 51s. An arrival of fine Melbourne was held at 54s. per sack. The Paris market, though declining lately, leaves no margin for export to this country, the six marks being worth 46s. per sack. The imports into London for the four weeks have been 73,124 sacks country made, 6,033 sacks 2,844 barrels foreign, against 78,912 sacks country made, 9,273 sacks foreign in 1866.

The demand for maize having fallen off from Ireland, this grain has declined in value 1s. to 2s. per qr. in the month, and become very dull, yet remaining high; but, as stocks in Ireland are limited, we expect a renewal of the inquiry.

The barley trade during the month has sunk into diminutive proportions; but supplies of British fine have been so limited that malting sorts have not given way, and all foreign have hardened in value from the retail inquiry alone; so that 50lbs. per bushel grinding have been bringing 34s. per qr. on small lots. This grain being pretty well used up, must remain scarce till harvest. The imports into London for the four weeks have been 2,548 qrs. British, 14,416 qrs. foreign, against 3,076 qrs. British, 25,511 qrs. foreign in 1866.

The malt trade throughout the month has been heavy, and, with fair stocks remaining, prices have given way 2s. per qr.

Almost our whole dependence for oats during the past month has been divided between English and foreign supplies, the former not being a tithe of the whole. Scotland and Ireland have been unable to send anything but cotchells; markets have, therefore, varied with the imports. The first Monday being double any other, there was a reduction of 6d. per qr. on medium and low qualities, of which the bulk consisted; while the proportion of fine was too small to sensibly affect their value. On the second Monday, with further large arrivals, there was more dulness; and on the third a positive abatement of 6d. per qr. on low sorts. This was again cancelled by the limited arrivals on the last Monday, leaving the month's loss only 6d., and that exclusively on inferior qualities. With home supplies failing, and foreign more uncertain, we shall be looking to the Russian arrivals this season with more than usual interest; and, dear as the grain now is, we may yet see a further enhancement. The arrivals in the port of London this month have been 2,030 qrs. English, 4 qrs. Scotch, 220 qrs. Irish, 223,628 qrs. foreign, against 1,541 qrs. English, 326 qrs. Scotch, 2,310 qrs. Irish, 200,101 qrs. foreign in 1866. The exports were 9,771 qrs. to France and Belgium.

There has been a diminution in the English supplies of beans, and, had it not been for unexpected arrivals from Egypt, there is no doubt the market would have been 5s. per qr. dearer. As it is, there is a gain of 2s. per qr. over the previous month; and all depends on the weather what our demand may be. The demand for maize for human food has so raised this grain that it is not longer a competitor with pulse. Some say that the standing crop is materially hurt by frost; and this, if true, will serve to enhance their value. The imports into London for four weeks were 1,934 qrs. English, 6,056 qrs. foreign, against 3,160 qrs. English, 1,589 qrs. foreign in 1866.

Peas, too, have run very short all through the month, and, with occasional touches of winter's cold, there has been both a demand for boiling and also for horse-feed at an improvement of about 2s. per qr., ordinary white being worth 45s. to 46s. per qr. On the arrival of Canadian imports there may be a check to the upward movement, though we do not hear of many coming. The imports into London for four weeks were 536 qrs. English, 770 qrs. foreign, against 320 qrs. English, 2,020 qrs. foreign in 1866.

Linseed imports have been on a very small scale, and prices have hardened in consequence 1s. to 2s. per qr., while cotton-cakes have got more into favour, and very few linseed are on hand. The red cloverseed trade has hitherto attracted little attention since the close of the season, there being little or nothing fine on hand; and it is the same with white seed and trefoil. Tares only sell at low rates for feeding. Canary has remained very dull, without much change of price; and this has been the case with white mustard seed.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white... old 67 76...new	60 to	72
,, ,, red ...... ,, 67 72... ,,	60	72
Norfolk, Lincoln, and Yorkshire, red	58	70
BARLEY ...32 to 35...Chevalier, new	38	48
Grinding...32 34...Distilling	37	42
MALT, Essex, Norfolk, and Suffolk ...new	67	71
Kingston, Ware, and town-made ... ,,	67	71
Brown ... ,,	52	60
RYE	32	37
OATS, English, feed 24 to 31...Potato	27	34
Scotch, feed ...22 30...Potato	27	34
Irish, feed, white 21 26...Fine	26	30
Ditto, black ...21 26...Potato	26	31
BEANS, Mazagan ...38 41...Ticks	38	41
Harrow ...38 41...Pigeon	43	48
PEAS, white, boilers..41 44 Maple 41 to 45 Grey, new	38	42
FLOUR, per sack of 280lbs., Town, Households	54	60
Country, on shore ...42 to 47 ,,	47	49
Norfolk and Suffolk, on shore	42	46

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Dantzic, mixed ...66 to 69...old, extra	70 to	76
Königsberg ...66 68...extra	69	70
Rostock ...63 70...fine	69	72
Silesian, red...62 65...white	65	68
Pomera., Meckberg., and Uckermrk. ...red old	63	67
Russian, hard, 57 to 63...St. Petersburg and Riga	59	64
Danish and Holstein, red	60	64
French, none...Rhine and Belgium	62	67
BARLEY, grinding 30 to 33....distilling and malting	33	38
OATS, Dutch, brewing and Polands 23 to 31...feed	19	25
Danish and Swedish, feed 22 to 30.... Stralsund	22	26
Canada 23 to 25, Riga 25 to 27, Arch. 24 to 27, P'sbg.	26	29
TARES, Spring, per qr. ...... small 35 37... large	38	40
BEANS, Friesland and Holstein	38	43
Königsberg ...37 to 41...Egyptian	38	39
PEAS, feeding and maple...37 39...fine boilers	39	44
INDIAN CORN, white...38 42...yellow	38	41
FLOUR, per sack, French..44 51...Spanish, p. sack	46	51
American, per brl...27 30...extra and d'ble.	31	34

IMPERIAL AVERAGES

For the week ended May 18, 1867.

Wheat	54,356¼ qrs.	64s. 11d.
Barley	3,162⅞ ,,	38s. 11d.
Oats	3,128⅝ ,,	27s. 0d.

COMPARATIVE AVERAGES.

	WHEAT.			BARLEY.			OATS.		
Years.	Qrs.	s.	d.	Qrs.	s.	d.	Qrs.	s.	d.
1863	65,825¼	46	9	3,808½	34	5	6,509	22	11
1864	74,821⅞	39	3	8,975	29	9	5,050¼	19	8
1865	88,015⅝	41	8	8,181	29	9	3,359⅜	22	9
1866	69,166¼	46	1	4,025⅜	36	2	3,616⅞	25	2
1867	54,356¼	64	11	3,162⅞	38	11	3,128⅝	27	0

AVERAGES

For the last Six Weeks:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.
April 13, 1867	60	9	39	9	24	5
April 20, 1867	61	4	39	8	25	5
April 27, 1867	62	11	39	1	25	6
May 4, 1867	63	10	39	9	25	3
May 11, 1867	64	9	38	11	25	10
May 18, 1867	64	11	38	11	27	0
Aggregate of the above	63	0	39	4	25	7
The same week in 1866	46	1	36	2	25	2

PRICES OF SEEDS.

BRITISH SEEDS.

Mustard, per bush., brown 15s. to 17s. white	10s. to	15s.
Canary, per qr.	52s.	60s.
Cloverseed, red	52s.	60s.
Coriander, per cwt.	18s.	20s.
Tares, winter, new, per bushel	5s. 0d.	5s. 6d.
Trefoil	20s.	23
Ryegrass, per qr.	18s.	20s.
Linseed, per qr., sowing 68s. to 72s., crushing	60s.	68s.
Rapeseed, per qr.	56s.	60s.
Linseed Cakes, per ton	£10 10s. to	£11 0s.
Rape Cake, per ton	£5 5s. to	£5 10s.

FOREIGN SEEDS.

Coriander, per cwt.	18s. to	20s.
Cloverseed, red 48s. to 60s., white	78s.	92s.
Trefoil	18s.	20s.
Ryegrass, per qr.	16s.	18s.
Hempseed, small 38s. per qr., Dutch	40s.	42s.
Linseed, per qr., Baltic 61s. to 62s...Bombay	68s.	69s.
Linseed Cakes, per ton	£10 10s. to	£11 10s.
Rape Cake, per ton	£5 0s. to	£5 5s.
Rapeseed, Dutch	64s.	68s.
Caraway ,,	42s.	44s.

HOP MARKETS.

BOROUGH, Monday, May 27.—The indications of improvement in our market noticed last week have since been fully developed, resulting in an active demand for all fine samples, at an advance of from 5s. to 7s. per cwt. The severe frost of the past fortnight has materially injured the bines, nipping the heads and giving them a sickly appearance; and instead of destroying the fly, as was expected, the attack is now general throughout the plantations, varying in quantity from four to ten on the leaf, and occasioning much anxiety to the growers. Accounts from Belgium report a bad attack of fly, which has had the effect of creating a better demand for fine samples, at improved prices. New York advices to the 15th inst. report increased firmness in prices and a steady consumptive demand, which bids fair to clear out shortly the whole of the present small stock on offer.

Sussex	£7	0	£7	7	£7	15
Weald of Kent	7	7	7	15	8	0
Mid and East Kent	7	10	8	8	9	9
Farnham and Country	8	0	8	10	10	0
Yearlings	5	0	6	6	6	15
Olds	2	16	3	15	4	4

POTATO MARKETS.

SOUTHWARK WATERSIDE.

Yorkshire Flukes	per ton	140s. to 180s.
,, Regents		120s. to 140s.
Lincolnshire Regents		120s. to 140s.
Dunbar and East Lothian Regents		130s. to 160s.
Perth, Forfar, and Fife Regents		110s. to 140s.
,, ,, ,, Reds		120s. to 130s.
,, ,, ,, Rocks		110s. to 120s.
French and German Whites		100s. to 110s.

BOROUGH AND SPITALFIELDS.

Yorkshire Flukes	145s. to 175s.	per ton.
,, Regents	130s. to 155s.	,,
Lincolns	130s. to 155s.	,,
Scotch	110s. to 165s.	,,
Foreign	105s. to 120s.	,,

COUNTRY POTATO MARKETS.—Barnsley, (Saturday last).: There was a fair average supply of old potatoes in the market. Rocks 16s. to 18s., flukes and regents 18s. to 20s. per load, 1s. 6d. to 1s. 8d. per peck; new kidney potatoes 4d. per lb. York, (Saturday last): Although the season for the last years' crop of potatoes is advanced, the supplies are still abundant, and beyond the wants of purchasers. The average price of table sorts was from 15s. to 16s. per tub of 280 lbs., but flukes, in a few instances, fetched 18s. The price of sets was 14s. per tub, and new potatoes 2s. 6d. per quarter. Doncaster, (Saturday last): The show of potatoes was a large one, and all well sold up. Regents and flukes made 17s., and seedlings 14s. per load of 18 stones. Malton, (Saturday last): Potatoes were in large request, both for table and seed purposes, and the supply not at all equal to demand. Manchester, (Saturday last): Potatoes 11s. to 20s. per 252lbs., new ditto 4s. 6d. to 11s. per score. Pontefract, (Saturday last): Potatoes 1s. 6d. per weigh.

ENGLISH BUTTER MARKET.

LONDON, Monday, May 27.—Our Butter market was fully supplied, with a tendency to lower prices.

Dorset, fine	104s. to 106s. per cwt.
Middling	Nominal.
Devon	94s. to 96s. ,,
Fresh	10s. to 13s. per doz.

POULTRY MARKETS.—Goslings 6s. 6d. to 8s., Ducklings 5s. to 6s., tame Rabbits 1s. 6d. to 2s., wild ditto 1s. to 1s. 2d., Pigeons 7d. to 10d. each; Surrey Fowls (couple) 11s. to 14s., ditto Chickens 9s. to 11s., Barndoor Fowls 6s. to 8s., Guinea Fowls 7s. to 8s. English Eggs 7s. 6d., French ditto 5s. 9d. per 100. Fresh Butter 1s. 2d. per lb.

ENGLISH WOOL MARKETS.

CITY, Monday, May 27.—Since our last report so little business has been doing in our market that the quotations have ruled almost nominal. The quantity of wool offering, however, is very small, and holders show very little disposition to force sales, although the decline in the quotations of colonial wool is 1d. to 2d. per lb.

Current Prices of English Wool.		s.	d.		s.	d.
Fleeces—Southdown hoggets	per lb.	1	4½	to	1	5
Half-bred ditto	,,	1	6		1	7
Kent fleeces	,,	1	5		1	6
Southdown ewes and wethers	,,	1	3		1	4
Leicester ditto	,,	1	6		1	7
Sorts—Combing	,,	1	2		1	8½
Clothing	,,	1	2		1	6½

LEEDS (English and Foreign) WOOL MARKETS, (Friday last.)—There is no noticeable change in the demand for English wool; prices are also unaltered. The cold weather having retarded clipping, new wool has not yet come largely to market. The present state of the worsted stuff and yarn trade is not favourable to the improvement of prices. Colonial wool has been rather firmer in price, but there is not much animation in trade. The reported withdrawal of a considerable quantity should give a little confidence to buyers. It is not an easy matter for importers to submit to the serious loss the present prices occasion.

WOOL.—During the earlier part of the month growers were firm in their demands, and the wide limit between their demands and the rates offered by the trade prevented the transaction of any large amount of business; but during the past fortnight, and especially at the public sales held yesterday, a better feeling was manifested, and good wools sold more freely at rather lower rates than those ruling last month. Since the sailing of the Ben Lomond with the first of the clip of 1866, 53,475 bales have been cleared for London. The Sobraon and Christiana Thompson, now almost loaded, have over 8,000 bales engaged; and the John Duthie, Sea Breeze, William Duthie, and John Masterman, also on the berth, will take about 9,000 bales. Freights continue low, say ½d. to ⅝d. in full.—*Sydney Herald, March* 23.

END OF VOLUME LXI.

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THE FARMER'S MAGAZINE.

JUNE, 1867.

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20 lb.	100	,, ,, (cask and measure	0	10	0
30 lb.	150	,, ,, included)	0	15	0
40 lb.	200	,, ,, ,, ...	1	0	0
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